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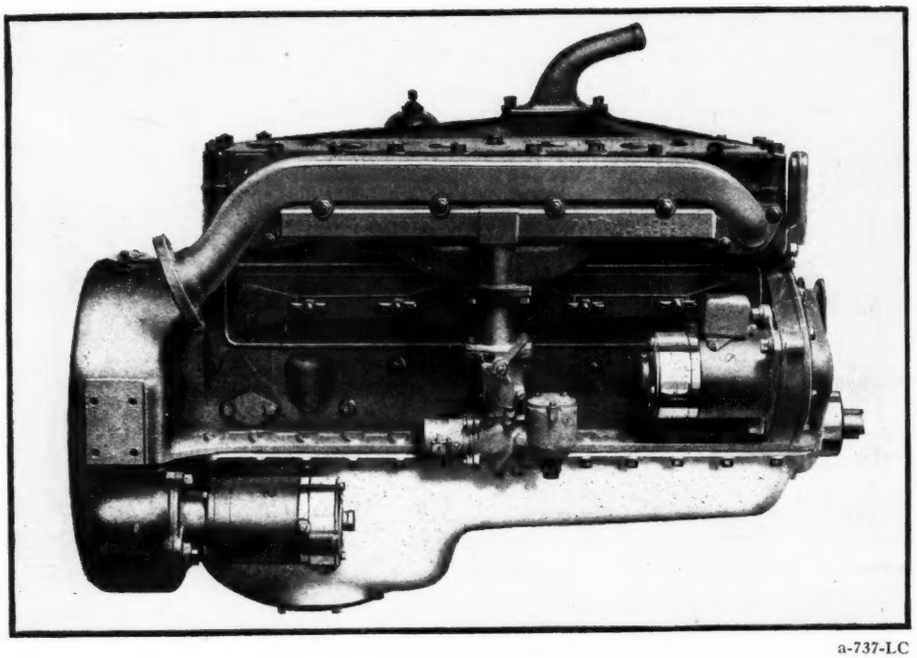

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AUTOMOTIVE INDUSTRIES
VOLUME 57 *Philadelphia, Saturday, October 29, 1927* NUMBER 18

"*New Competition*" Calls *for* Closer Bond *in* Automotive Ranks

Rivalry between industries for greater share of consumers' dollar makes necessary maximum cooperation between car manufacturers and sources of supply.

By Norman G. Shidle

GRADUALLY the cry for more profits has extended through all industry. The condition of "profitless prosperity" which has beset so many automotive concerns in the last year or so is in no sense confined to the automotive industry nor to those supply sources from which our industry draws its raw materials, parts, tools and factory equipment. In scores of other fields is heard the same lament—"Plenty of business, but not enough profits."

Sellers are accusing buyers of "Purchasing profiteering," similar in character, although opposite in direction, to the sales profiteering which was so commonly condemned during and after the war. Purchasers, on the other hand, are pointing to the fierceness of the competition under which they are laboring as justification for the very close buying which they are doing. And economists are interpreting current conditions as being the normal expectancy of an excess of supply over demand.

While the existence of unfavorable purchasing conditions in other industries doesn't, of course, make any less acute such lack of profits as there may be in some parts of the automobile field, recognition of such conditions does tend to give proper perspective to any analytical view of the automotive situation. As a matter of fact, the common character of the problem is an advantage in one way, because the more widespread a problem of this kind is, the more vigorous and intelligent treatment it is likely to get.

And there can be no question about the fact that this profitless prosperity about which so much talking is being done has been and is affecting a good many other industries much more strongly than it is the automotive. Recent expressions of important business men both in written articles and public talks emphasize this fact rather clearly.

And in all this welter of discussion about buying, selling, supply and demand, the existence of what O. H. Cheney, vice-president, Irving American Exchange National Bank, was the first to dub "the new competition," is being more fully recognized. The new competition, briefly defined, may be said to be competition for markets between industries as opposed to the older type of competition merely between companies in the same industry. The growth of this type of competition tends to bind together more closely than ever the various units of a given industry for the attracting of as great a proportion of the consumers' dollar as can be obtained. Thus the unity of the automotive industry as an industry is emphasized

"THE automobile manufacturer actually needs the enthusiastic, constructive cooperation of the best thought in the parts and factory equipment industries if he is to continue so to improve his methods, products and processes as to enable him in the future, as in the past, to meet successfully the new competition of industry and industry for a greater share of the consumer's dollar.

"Passive supplying of demand is not enough.

"And that active, aggressive cooperation from supply sources is being and will continue to be obtained in fullest measure by those manufacturing organizations which, in their purchasing as well as in their selling policies, sincerely strive to operate on the basis of fundamental and practical fairness."

even more strongly than in the past, as in the common objective and potentialities of the industry as a whole.

This being the case, the current efforts both of individual companies and associations within the industry to improve the buying practices and better the cooperation between buying and selling units assumes an unusual significance. That some progress is being made cannot be doubted; many firms in the industry already have recognized the necessity for fairness in buying as in selling if they are to build their own enterprises and the industry of which they are a part to its best possibilities on a long-swing basis. Plenty of opportunism still exists in buying practices, however, and only firm, constructive action on the part of sellers over a long period of time can eventually eradicate the last of these unfavorable aspects of automotive purchasing.

May Hold Different Views

It must be remembered that the actual purchasing practices of a given concern do not reflect necessarily the ideas of every responsible executive in that firm as regards how buying should be done. It does, of course, represent the policy dominating at the moment. If that policy be utterly unfair to the supplier, however, close investigation of the individual instance usually will show that at least some responsible executives in the purchasing company see and sympathize with the seller's viewpoint and see the long-swing futility of certain temporarily-gained advantages. The views of these latter executives, while perhaps not dominant at the moment, will continue to be expressed within the organization and—assuming they are fundamentally right and that current practice is short-sighted—their principles are almost certain to triumph in the long run.

Hear the tale of a production executive, for example, whose company on some occasions has insisted on buying on a purely price basis, despite the particular production department's ideas as regards sources of supply. A new part—an oil pump, let us say, since that wasn't what it was—was to be incorporated in a new model. The production and engineering departments has tested several types and has estimated on the cost of manufacturing the unit within their own plant. They decided that there would be a marked saving by buying the unit outside.

Picked the Cheapest Source

They recommended that the unit be bought from a certain well-known parts manufacturer. The company insisted, however, on letting the contract to a small local concern because the price given by the latter was some 10 cents per unit lower. Then the production began to come through. The first 100 pumps which were delivered wouldn't come even close to passing inspection. The production department had the job of fighting it out with the parts maker. Finally, in desperation, in order to get this part through in time to equip the cars which had to be in dealers' hands immediately, the job was set up in the car plant and the first 400 or 500 were manufactured at a cost of about five times that which had originally been bid by the stable, reputable parts maker in the first place. Other instances in other plants might easily be cited.

Production men in particular are realizing the false economy of taking long chances as regards quality, promptness of delivery, adequacy of service and so forth, simply for the sake of what looks for the moment like a lower price. And plenty of purchasing agents see this phase of the picture just as clearly as anybody else. There is a growing tendency to look to the ultimate cost as well as the quoted selling price.

The same thing seems certain to be true as time goes on in connection with machine tools and other types of factory equipment. It is generally recognized that the amount of "free service" rendered to the car and parts manufacturers by the machine tool makers has grown by leaps and bounds over the past decade. Questioned as to whether, in his opinion, the amount of such service had reached or passed a reasonable limit, a prominent machine tool builder the other day said something like this:

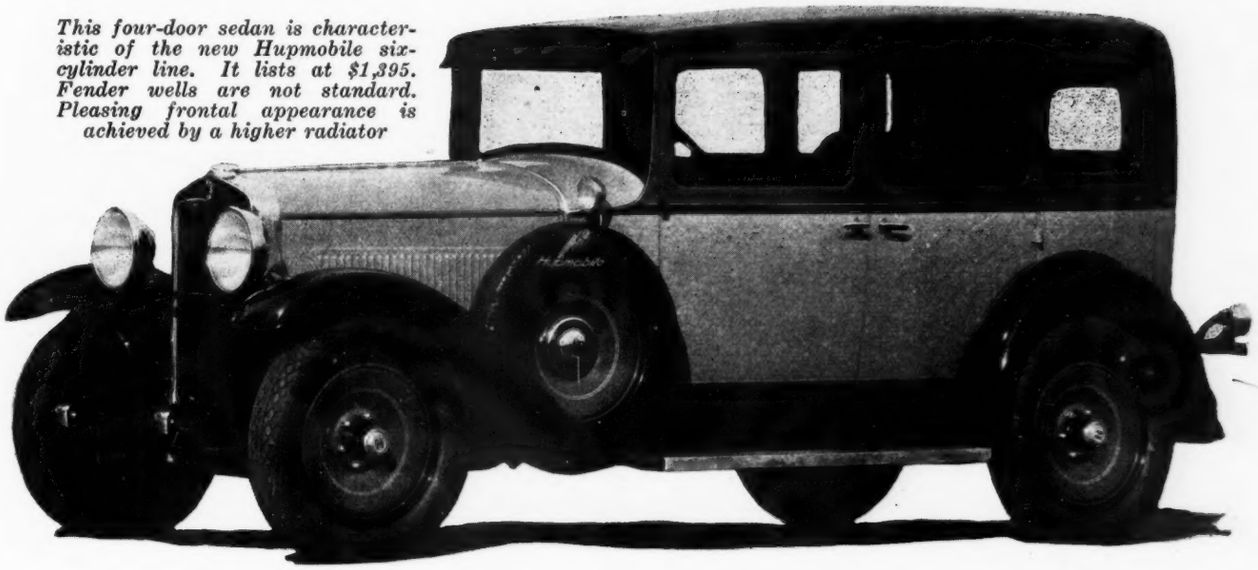
Service Must be Paid For

"No, I don't believe it has. We do render a whole lot of so-called 'free service' but I think that basically it is part of our function to do so. I don't believe there is any turning back in that matter anyhow, whether we wanted to or not. There is a strong necessity, however, for us to get a fair return in the way of profit on the machines which we sell. All of this increased service costs money and has to be paid for somehow; unless we can get a fair profit on the tools which we sell, we won't be able to continue that broad development work which has been such a potent and vital factor in driving forward automotive progress in the past."

There would seem to be much sense in this viewpoint. The machine tool and factory equipment industry, as well as the automotive production man himself, has been a strong factor in forwarding the remarkable development in automotive production methods which has made our industry so strong a factor in the new competition.

The automobile manufacturer actually needs the enthusiastic, constructive cooperation of the best thought in the parts and factory equipment industries if he is to continue so to improve his methods, products and processes as to enable him in the future, as in the past, to meet successfully the new competition of industry and industry for a greater share of the consumers' dollar. Passive supplying of demand is not enough. And that active, aggressive cooperation from supply sources is being and will continue to be obtained in fullest measure by those manufacturing organizations which, in their purchasing as well as in their selling policies, sincerely strive to operate on the basis of fundamental and practical fairness.

That the proportion of automobile concerns moving along these lines is growing steadily, if slowly, is sufficient reason for fullest confidence in the final outcome.



This four-door sedan is characteristic of the new Hupmobile six-cylinder line. It lists at $1,395. Fender wells are not standard. Pleasing frontal appearance is achieved by a higher radiator

Hupp "6" Has New Body Lines and Larger Engine

Cylinder head, completely machined on inside, has spark plug over exhaust valve. Steeldraulic four-wheel brakes are adopted. Liberal use made of chromium plating.

By A. F. Denham

GREATLY altered in appearance, the new six-cylinder line announced by The Hupp Motor Car Co. embodies also numerous improvements in mechanical design.

Although prices differ somewhat from those of the former line, the price range remains about the same—$1,335 to $1,395—for the stock body styles. The roadster at $1,335 is $50 lower, the two-door sedan is $40 lower at $1,345 and the four door-sedan $10 higher at $1,395. A seven-passenger phaeton, largely for export, at $1,395, replaces the former five-passenger phaeton at $1,325. The new four-passenger coupe lists at $1,385.

In addition there will be two custom-equipped lines consisting of the same models with special equipment. With five wire wheels the bodies are listed $80 higher. At this price the models are also obtainable with six disk wheels including fender wells, cowl bars, nickel headlights, cowl and tail-lights, and trunk rack. Similar equipment with wire instead of disk wheels increases the price of the stock body styles by $150.

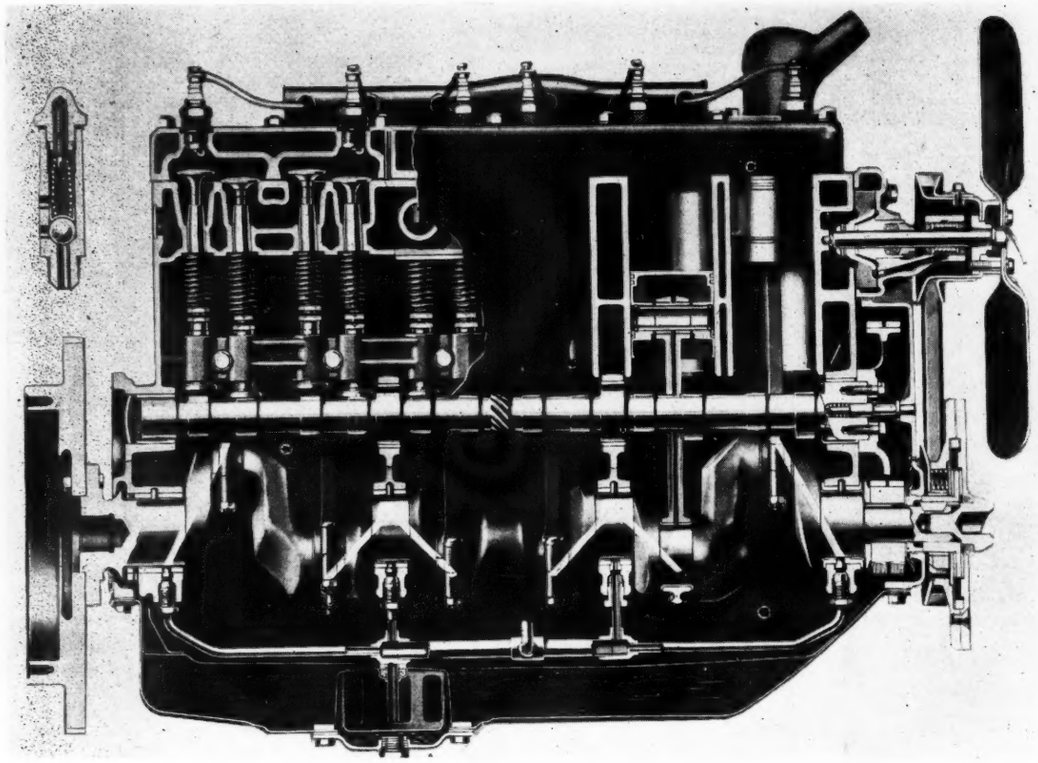
Leading the mechanical chassis changes is the adoption of the Midland Steeldraulic four-wheel brakes. These brakes, pioneered by and perfected in cooperation with Hupmobile, are of the internally expanding type, using a one-piece shoe with molded composition lining; they are self-energizing, the wrapping effect being obtained by flanging half of the shoe. This molded composition is said to have different friction characteristics than the woven type and wear of the linings is materially decreased. The brake being self-energizing, only light pedal pressure is required. Adjustment can be effected from the outside.

The engine of the 1928 model is a development of the previous Hupp six-cylinder engine, but embodies a number of important changes. The bore is now 3¼ in. instead of 3⅛ in., while the stroke remains 4¼ in. This change has increased the piston displacement from 196 to 211.5 cu. in. Naturally, the maximum power has been increased, the engine now peaking at over 57 hp.

Detonation Tendencies Reduced

While the larger bore is partly responsible for the decided increase in power, reflected in improved performance, a new type of cylinder head design has also contributed toward this end. The new head, which is completely machined on the inside, has the spark plug located over the exhaust valve. This design was adopted following considerable research which indicated that detonation tendencies are reduced to a minimum when the spark plug is located in the hottest portion of the combustion chamber.

The additional cooling capacity called for has been provided by increasing the depth of the water passages ¼ in. A number of important changes have been made also in the crank train. Connecting rods are now rifle-drilled, to provide pressure lubrication to the piston pins. This has involved enlarging the drilled passages in the crankshaft and lengthening the main-bearing and



Sectional views on this and opposite page show details of Hupp six engine construction. Note shape of combustion chamber and manifold heat control. Connecting rods are drilled for piston pin lubrication

connecting-rod oil grooves. The dimensions of the crankshaft and connecting rods remain unchanged, however. All bearing caps are of heavier design, in keeping with the increased power. Three-ring, cast-iron pistons are continued. Piston pins, however, are larger in diameter by ⅛ in., being 1 in. now. They are now full floating, a bushing being fitted in the rod. Valves are unchanged.

Among the changes on the outside of the engine is the substitution of a pressed steel for a forged fan-pulley hub. The new four-bladed fan is designed to balance the thrust due to the water pump, fan and water pump rotor being mounted on the same shaft. The capacity of the cooling system—including the McCord cellular radiator—is now 13 quarts. A new Stromberg T-2, 1¼ in. carburetor is also included. As formerly, an air cleaner, gasoline filter and oil filter are standard equipment.

Manifold of New Design

A further feature of the engine which contributes to better performance is a manifold of new design. The latter has two butterfly valves operated by the same control lever, the larger valve being in the main passage while the smaller one is in the secondary passage. When the lever is put in the "heat on" position, the large butterfly is closed and the small one open, and all exhaust gases have to pass around the inlet manifold and through the secondary, slightly restricted, portion of the exhaust manifold. When it is in the "heat off" position the gases do not pass around the inlet manifold although there is a slight heating effect. Hupmobile engineers state that when the manifold heat control lever is in the "on" position quicker intake heating is obtained than in any other design which has come to their notice.

Changes have been made also in the Auto-Lite electrical system, the semi-automatic distributor operating according to a new spark advance curve. A new ignition lock adopted on this car locks the distributor through a steel-clad cable. A Willard 100 amp.-hr. battery is included in the electrical system. Starter engagement is by Bendix.

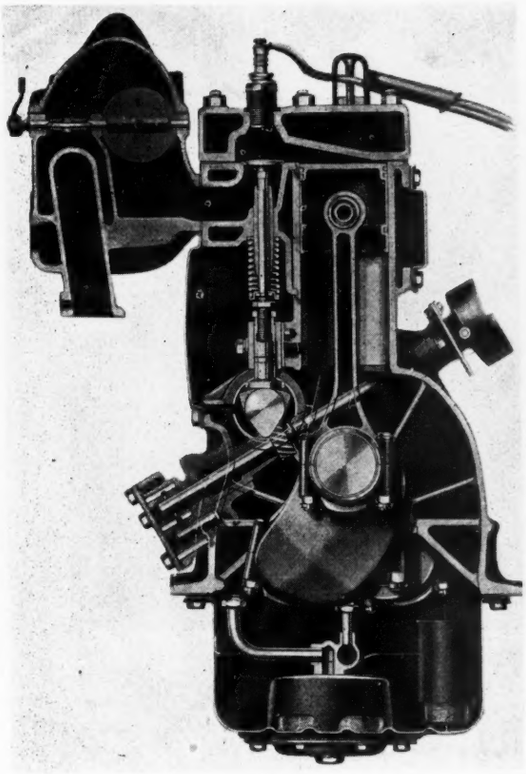
A flexible disk center is now provided in the driving member of the single plate Borg & Beck clutch. As compared with the previous model, the clutch housing is heavier, and a heavier gage clutch shield has been provided.

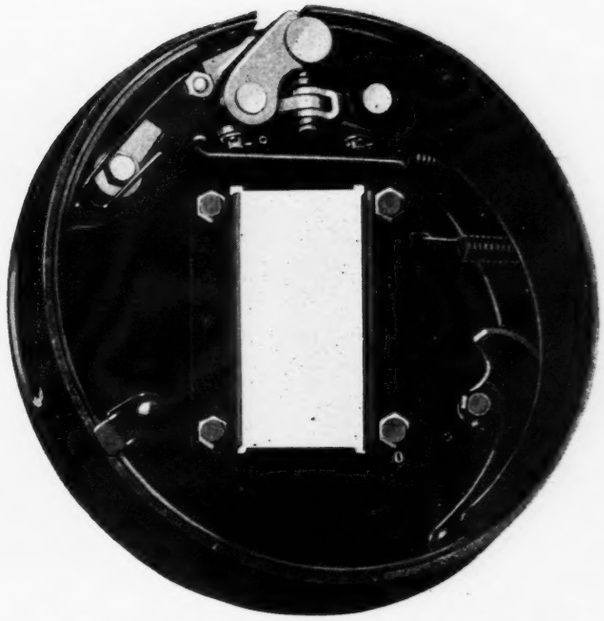
Wider-faced teeth are now used on the constant mesh gears of the Detroit Gear transmission. Gear reductions have been changed somewhat, low gear reduction now being 3.11 to 1 as against 3.42 to 1. Chrome molybdenum steel axle shafts have been incorporated in the rear axle of generally the same design as previously. The final gear reduction has been changed somewhat, from 4.90 to 1 to 4.73 to 1. Wheels are smaller, 19 in. in diameter, and take 29 x 5.50 in. balloon tires. The front axles remain the same. Frames are of entirely new design and provided with a double drop, to lower the bodies; 5/32 in. stock is used for the side rails, which have a 5½ in. depth and 2⅛ in. flanges. With the new frame, smaller wheels and new body designs, a total decrease in height of about 4 in. has been effected.

Springs are semi-elliptic all around. Front springs, which have a negative camber and are shackled at the front end, have a length and width of 37 x 2 in., eight leaves being used. The rear springs are 54 x 2, using 11 leaves. The steering gear is a Ross cam and lever.

As previously mentioned, molded composition lining is used in the Steeldraulic four-wheel brakes. These have drum diameters of 12 in. and a 2 in. lining width. In servicing lining when necessary, the entire shoe is replaced. A feature of the brake is that it is assembled with 1/16 in. clearance, making for free running. This clearance is taken up in about 2 in. of pedal travel. A new idea in emergency brake application is also incorporated, in that the hand lever actuates the brakes on all four wheels, the same as the pedal. This lever remains located on the left.

Bodies are a Murray Corp. product. With their lower





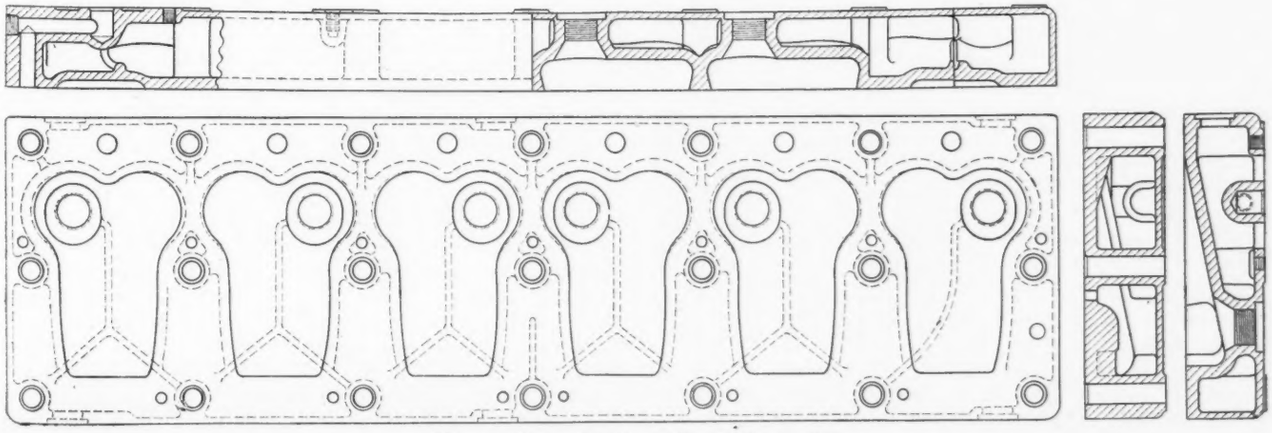
A one-piece shoe is used in the internal expanding Hupmobile Midland Steeldraulic four-wheel brakes. It is claimed that the molded composition lining used requires adjustment only every 50,000 miles or so

lines and rounded contours they represent the most attractive Hupmobile 6 ever offered. Chromium plating is used wherever metallic finishes appear, including radiator shell, head lamp rims, door handles, hood holddown clamps, etc. A novel idea is found in the hood, the central, piano-type hinge having been made quite prominent and chromium-plated. A low radiator cap, also chrome-plated, is stream-lined into this hinge. On the closed models a swinging type windshield, crank-operated is used, while the open models have forward-folding windshields. Sun visors on the closed models are of the cadet type.

All projecting chassis parts are covered with sheet metal. In the rear of the body, for instance, the sheet metal cover over the gasoline tank is extended over the spring horns. Two-tone color schemes in pyroxylin finish are used on the bodies. A molding, slightly darker in shade than the basic body color, runs along the bottom of the bodies and is carried around the fenders. Window reveals are finished in contrasting colors. To carry out the rounded lines of the rear quarters, rear windows are also curved.

On the inside of the body such features as a steering column adjustable to three positions, a full-length hinged accelerato.- pedal, and saddle spring cushions are found. In the coach the individual front seats have rigid backs. The instrument panel, which carries a dash gasoline gage in addition to the usual instruments, has a central Hupmobile monogram. Manifold heat control and choke buttons occupy positions on opposite sides of the central panel while the light control, spark and throttle levers are mounted in convenient positions on the steering wheel.

Included in the standard equipment is the usual rear vision mirror, an automatic windshield wiper, a cowl ventilator, combination stop, reverse and tail-light, double filament headlights and front and rear snubbers. A trunk rack is standard on the brougham. The tire carrier is drilled for a padlock, while locks are provided when wheels are carried in fender wells. Although bumpers are not standard, these will be offered from the factory through Hupmobile dealers.



New cylinder head of Hupp six engine

Aviation Pictured *as* Nearing *and* Mechani

S. A. E. aeronautic meeting, heights in point of atten and the variety of sub

By J. C.

AGAINST the inspiring background of the successful transoceanic flights and the amazing spur to commercial aviation given by them, the aeronautic meeting of the Society of Automotive Engineers, held Oct. 18-20, in New York, reached new heights in point of attendance, interested discussion and variety of subjects covered.

From the sessions the members and their guests brought a picture of an industry drawing closer to the goals of quantity production, mechanical safety and precision, and operating efficiency. The programs ranged from airways and airports to supercharging and aerial navigation. The most earnestly studied questions of the moment were brought out into the open and discussed.

The papers and discussions revealed an accelerated trend toward metal construction and a disposition to examine methods of construction in the light of possible quantity output later on. The reliability of the latest designs in powerplants was shown in figures that frankly caused astonishment to those not intimately in touch with operation developments.

Perhaps the greatest divergence of opinion on an important matter arose around the question of single and multi-engined planes. Anthony H. G. Fokker saw a very limited field of utility for the two-engined plane, but his statements did not pass unchallenged. Perhaps more surprising was the opinion that under many conditions of service the single-engined plane may be as safe as, if not more safe than, the plane carrying three or more engines. Mr. Fokker himself did not take this view, but he was of the opinion that the single-engined plane would continue to be the mainstay of commercial aviation.

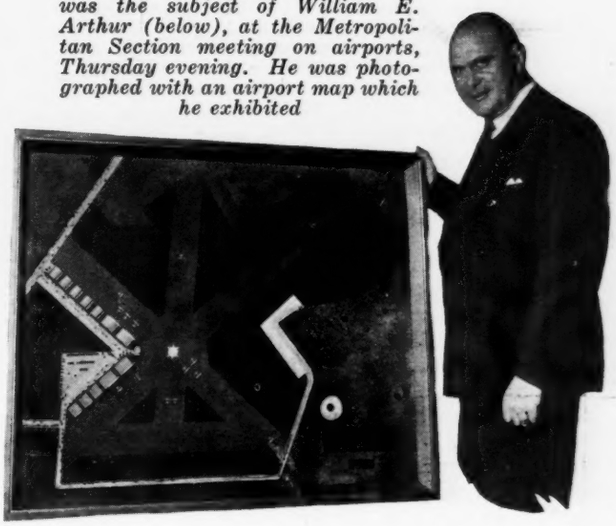
E. P. Warner, Assistant Secretary of the Navy for Aeronautics, presided at one session and read a paper at another

Two important pronouncements from official sources marked the progress of the sessions. E. P. Warner, Assistant Secretary of the Navy for Aeronautics, indicated clearly that the Government did not expect producers of commercial aircraft to keep in mind possible military uses for their products. A policy of free development will be maintained which is in sharp contrast to the restrictions and regulations imposed upon aviation by some foreign governments. Likewise in operations the industry may be assured of untrammeled business beyond the necessary minimum of regulation designed to insure safety.

Even on the question of safety, however, Secretary Warner expressed confidence in the good business sense of the manufacturers and engineers, believing that

W. B. Stout (left) and C. M. Young. The former contributed a paper on metal airplane construction at the S.A.E. meeting and the latter spoke on the technical problem of control of air worthiness

Design and construction of airports was the subject of William E. Arthur (below), at the Metropolitan Section meeting on airports, Thursday evening. He was photographed with an airport map which he exhibited



Goals *of* Quantity Production cal Safety

held in New York, reaches new dance, interested discussion jects which are covered.

Gourlie

without any prodding by the Government they would design aircraft as free from the possibility of mechanical failure as human ingenuity could devise.

At another session William P. MacCracken, Jr., Assistant Secretary for Aeronautics of the Department of Commerce, declared that the Government could not be expected to design or finance the building of airports. Advisory service might be rendered, and airways and meteorological services would be maintained, but beyond that point private and municipal interests would have to take charge.

Another of the Washington group, Frederick C. Hingsburg of the Department of Commerce, showed that marking and lighting of the main airways of the country had gone farther than commonly expected and that the work will be greatly extended in the year forthcoming.

A technical discussion of monoplanes and biplanes by Prof. C. H. Chatfield, Massachusetts Institute of Technology, served in a way to show that rather minor considerations in many cases will dictate the choice of a type. It was generally agreed that each would persist a long time for the purposes that they are best fitted for, although the consensus was that a stimulus to monoplane designing had been given by the extension of metal construction and the proved value of the materials now used.

The very absence of debate on the subject of biplanes versus monoplanes indicated agreement on most of the points of relative superiority. The producers of commercial monoplanes were rather insistent that the type could be maintained more economically. The discussion quickly veered around to a comparison of low wing and high wing monoplanes from the safety viewpoint and later from the passenger-carrying angle.

At frequent intervals the question of what would most please passengers and inspire confidence in them came to the forefront. William B. Stout, Stout Metal Air Services, Inc., said that the polished duralumin planes at the Ford airport has been a major factor in bringing thousands of passengers to their first air rides. Biplanes and low wing monoplanes, it was said by one or two speakers, restricted visibility for the passengers, but on the other hand, it was pointed out that there was always an avenue of vision open for view of the underlying country.

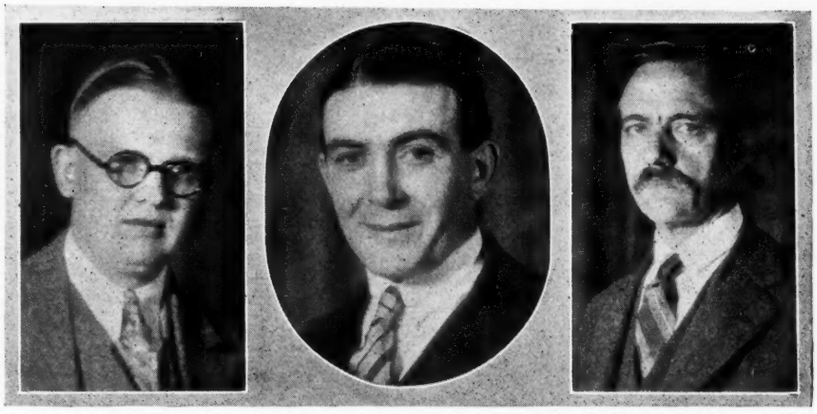
H. M. Crane, who presided at an interesting session on mixed subjects Thursday afternoon

Elimination of wing flutter has been attained by metal construction of the monoplane, it was held, and

supposed difficulty with metal—corrosion—has been found much less serious than supposed. Even on seaplanes and flying boats the metal has successfully withstood the onslaught of the elements.

On the subject of metal construction Secretary Warner pointed out that many manufacturers had turned away from wood and he knew of no instances where they had changed back. There was an all-sufficient reason for using metal if no other existed—the imminence of quantity production.

Among the more technical papers was one bearing on this subject by J. A. Roche, Army Air Corps, who compared in detail the various materials of airplane construction in different uses.



Left to right—Opie Chenoweth, Capt. C. H. Biddlecombe and Charles W. Hall, all of whom read papers at the S. A. E. aeronautic meeting

Concerned primarily with structural safety Wing Commander E. W. Stedman of the Department of National Defense of Canada, caused some discussion by a statement that planes should be built incapable of breaking in the air. He realized that a commercial plane theoretically should not be required to have as much strength as a military pursuit ship built for stunting, but he said that where sufficient power for stunting was available, there was always a temptation for the pilot. It was generally felt, however, that proper supervision of pilots was preferable to an otherwise unnecessary burden on commercial manufacturers and operators.

A safety problem resulting from the substitution of the new high-powered engines in craft built for lower-power engines of equal weight is being attacked from different angles by the American and Canadian governments.

The various papers on design and construction of airports revealed a tendency to extend the length and width of runways. Although the newer planes can get away and land with the same weight quicker than their predecessors, as commercial aviation expands the weight carried tends to increase and to require more airport space. Night lighting and beacon signals were constantly emphasized in line with the rapid extension of night flying. Three of these papers were given at the Metropolitan Section meeting of the society, which came on the evening of the third and final day of the aeronautic meeting.

William P. MacCracken, Jr., Assistant Secretary of Commerce for Aeronautics, who urged a commercial airport for New York City

The enormous difficulties of oversea navigation were brought home to the members by an expert of long practical experience, Lt. Albert Hegenberger of the Army Hawaiian flight. Not all the methods and instruments now known can give the precision to oversea flight that is customary to the skipper of a small tramp steamer, it was pointed out, and there is endless room for research and development in this field.

It was brought out by Victor E. Carbonara, Pioneer Instrument Co., that the unwillingness of many pilots to use the instruments at their disposal was an obstacle to the improvement of the present designs.

Aside from the paper by Capt. C. H. Biddlecombe on the results of operation of Wright air-cooled engines, there was only one other study on engines at the session presided over by H. M. Crane, assistant to the president, General Motors Corp. This was by Opie Chenoweth, Wright Field, Army Air Corps, and considered supercharged aircraft engines.

On the Aeronautic Meeting Committee, which so successfully planned the programs, were E. P. Warner, chairman; E. E. Aldrin, H. M. Crane, E. T. Jones, Alex Klemin, W. L. LePage, Lester D. Seymour, W. B. Stout and John A. C. Warner.

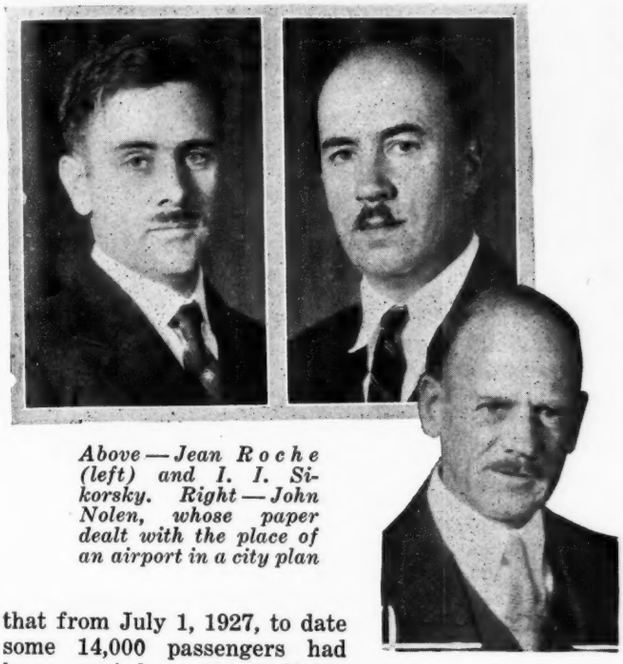
The meeting opened with a session devoted to papers on structural problems and one of standardization of wind tunnel testing. Prof. Klemin of the Guggenheim School of Aeronautics occupied the chair following the opening of the meeting by Secretary Warner.

Metal Construction

"Bill" Stout was the first speaker of the group presenting papers on studies in metal construction, his remarks taking the form of an extemporaneous discussion on the Ford developments. Looking back over the past few years of Ford experience in practical operation of airplanes he stated very positively that they had noted a definite preference on the part of the public toward the all-metal airplanes. He called attention to the high polish given to external surfaces. It was his opinion that this finish had a dual advantage, creating a good impression in the minds of prospective passengers as well as facilitating the work of keeping the external parts clean.

Questioned regarding the protection of the metal from corrosion, he said that internal surfaces were given a coat of clear spar varnish but that the external (polished) surfaces were left uncoated and that service experience seemed to justify this practice. The practice was made of always keeping the exposed surfaces clean, even washing them down with a stream from a hose when necessary, and wiping the metal dry. This was greatly facilitated by the polishing of the metal and he considered it better than the method of depending upon an external coat of varnish.

As indicative of public willingness to fly, Stout said



Above — Jean Roche (left) and I. I. Sikorsky. Right — John Nolen, whose paper dealt with the place of an airport in a city plan

that from July 1, 1927, to date some 14,000 passengers had been carried on short flights at the Ford Airport at $5 each, although no effort had been made to solicit this business.

Charles Ward Hall, structural engineer, who has been devoting much of his time to development of metal airplane construction, was the second speaker. Using a considerable number of slides to illustrate his remarks, he traced his work from the construction of the first experimental wings of several years ago up to the construction of complete airplanes. In some typical wing structures shown, the longitudinals or "flange members" of the spars consisted of sheet metal formed to the shape of tube excepting that the edges of the strips were bent outward to facilitate making of connections. This form of section he referred to as a "flanged tube" and liberal use of the shape was made throughout the structures shown in the slides. The complete spar consisted of top and bottom members of this type with lattice structure between.

Part of the talk was devoted to detailed description of the construction of some all-duralumin boat hulls in which both the internal framing and the "planking" consisted of formed duralumin sheet or strip. Including among his remarks some typical figures on the weight of these constructions, Mr. Hall surprised many of his hearers by his statement that well-designed metal construction showed a substantial reduction in weight as compared with wood construction.

Several slides were shown illustrating in various stages of construction a small all-duralumin flying boat designed to carry two men. The hull alone weighed only 68 lb., and the complete flying boat empty weighed only 530 lb., although capable of carrying a total useful load (including fuel, oil, crew, etc.) of 440 lb. This particular boat has been in practical use for about four years and showed no signs of deterioration when recently examined. Construction of large ribs of 102 in. chord had been accomplished with a weight of 19 oz. each. Complete medium thick wings of 92 sq. ft. had been constructed showing a weight (before covering) of about 0.52 lb. p. sq. ft. The same type of wing complete with metal covering weighed around ¾ lb. p. sq. ft.

J. A. Roche's paper on Selection of Materials for Aircraft Structures was devoted entirely to outlining the basic considerations involved and an effort was made to establish bases for direct comparisons between the various materials as applied to the problems involved in aircraft structures. Developing tables of the relative values of spruce, duralumin and chrome-molybdenum steel (the latter both with and without heat treatment), and considering the importance of air resistance and other elements, he drew the following general conclusions:

(1) Exposed struts will be streamlined steel tubes for pursuit and racing airplanes and streamlined aluminum-alloy tubes for transports
(2) External bracing will be accomplished with as few struts as possible, such trusses being chosen as consist mostly of streamlined tension rods
(3) Engine mounts for all types of plane will be mostly of steel, and the portion of the fuselage aft of the engine mount will be an aluminum-alloy truss or shell
(4) Spars of small externally braced thin wings will be made of spruce and simple duralumin sections, while spars of large internally braced thick wings will be metal trusses
(5) Wing ribs will be of spruce or aluminum alloy in all types of airplane
(6) Propellers of large transports will be of aluminum alloy; while those of fast airplanes will be of high-strength steel, because of its greater specific fatigue resistance and the higher efficiency possible with very thin sections.

Some very interesting photographs of metal construction work of the Naval Aircraft Factory and Navy contractors were included in the paper of Com. R. D. Weyerbacher, a digest of this paper being read by Lieut. C. B. Harper in the absence of the author. Bearing out the contention of Mr. Hall regarding the weight of metal construction, Weyerbacher claimed that it is reasonable to expect a weight reduction of about 25 per cent at present and that as great a saving as 50 per cent may be attained by extreme refinement in design of metal structures in the future. The metal flying boat hulls built by the Navy have already showed savings of weight ranging around 25 per cent even before allowing for the elimination of "water soakage" experienced with wood hulls in service. One case was cited in which a reduction in weight of about 35 per cent had already been attained by the substitution of all-metal construction for wood in the design of a hull of the PN type.

W. L. LePage served as chairman of the Wednesday afternoon session

Reference was made to the development of extruded sections for use in duralumin construction and the advantage of this method was illustrated by drawings of streamlines and other sections in which wall thicknesses in the cross section were varied as required to suit the

structural needs. The "rubber die" method of forming soft metal parts (to which some reference was previously made in *Automotive Industries*) was described. With this method dies costs are reduced by constructing only a single die of bronze and using a sheet of rubber instead of a counterpart die. This method was found very practical in the production of formed duralumin ribs and it was found possible to form even sharp corners in the pressing by giving it a second impression between the bronze die and a counterpart of lead cast directly from the original bronze die as a mold.

Guarding Against Corrosion

The author stressed the necessity of the design engineer guarding against corrosion in service. Contact between dissimilar metals was mentioned as one of the causes of accelerated corrosion and complete insulation of the dissimilar metals was recommended.

Igor Sikorsky traced the experiences of his firm with metal construction and stated that no effort had been made to develop constructions of extreme refinement. His opinion, as exemplified in the products of his factory, was that members of very thin metal should be avoided and his practice had been to sacrifice some possible savings of weight where these would have necessitated the use of very thin material. He felt that this practice in design resulted in constructions which could be subjected to a reasonable amount of corrosion before any appreciable strength was sacrificed. The practice, he pointed out, had a further advantage in lowering initial fabrication and maintenance costs. Touching upon the construction of large airplanes (a subject on which he has had most extensive experience in Russia and in which practice he was perhaps the earliest exponent), he said he considered metal to be the only practicable material for this purpose.

In the absence of the author, E. N. Fales' paper on Standardization Tests in the Wind Tunnel was read in digest form by Mr. Roche. Taking up at some length the problems involved in efforts to make wind tunnel tests comparable, the author outlined what had been accomplished in this field to date and concluded by recommending further extension of the McCook Field tests. Summarizing the improvements in wind tunnel technique resulting from the standardization tests, he listed nine points, including discarding of the former 3 by 18 in. model in favor of a 6 by 36 in. size; the reduction of tunnel turbulence by installation of means for straightening of the air flow; and the revision of ideas on necessary test speeds in the tunnel indicating that a speed of 40 m.p.h. is too low but that there is no need of increasing test speeds above 150 m.p.h.

It seemed particularly indicative of the close cooperation existing between the United States and Canada that the Wednesday evening session should have included papers on Government control of aircraft design by both Clarence M. Young of the U. S. Department of Commerce and Com. Stedman of Canada. Mr. Young's paper was devoted largely to an outline of the work of the Department of Commerce in forming its policies toward control of aircraft design. Some comments were made on the problems encountered and it was pointed out that the present method of classifying types of airplanes as to load factors was based upon gross weight. Experience to date brought to notice the fact that this basis would permit the substitution of such engines as the 200 hp. Wright in airplanes originally designed for the 90 hp. OX engine. Such a change, while not materially changing the gross weight of the airplane, produced a craft with considerably greater maneuverability and which should logically come under a different classification. An improved method of classification has been devised and will soon become effective.

Touching upon the necessity of standardized tests of new commercial airplane engines, it was stated that plans were being developed by which standard airplane engine tests would be conducted for the engine builders at the Bureau of Standards. The question was raised of cost and the advantages and disadvantages of making all tests at the expense of the Government were considered.

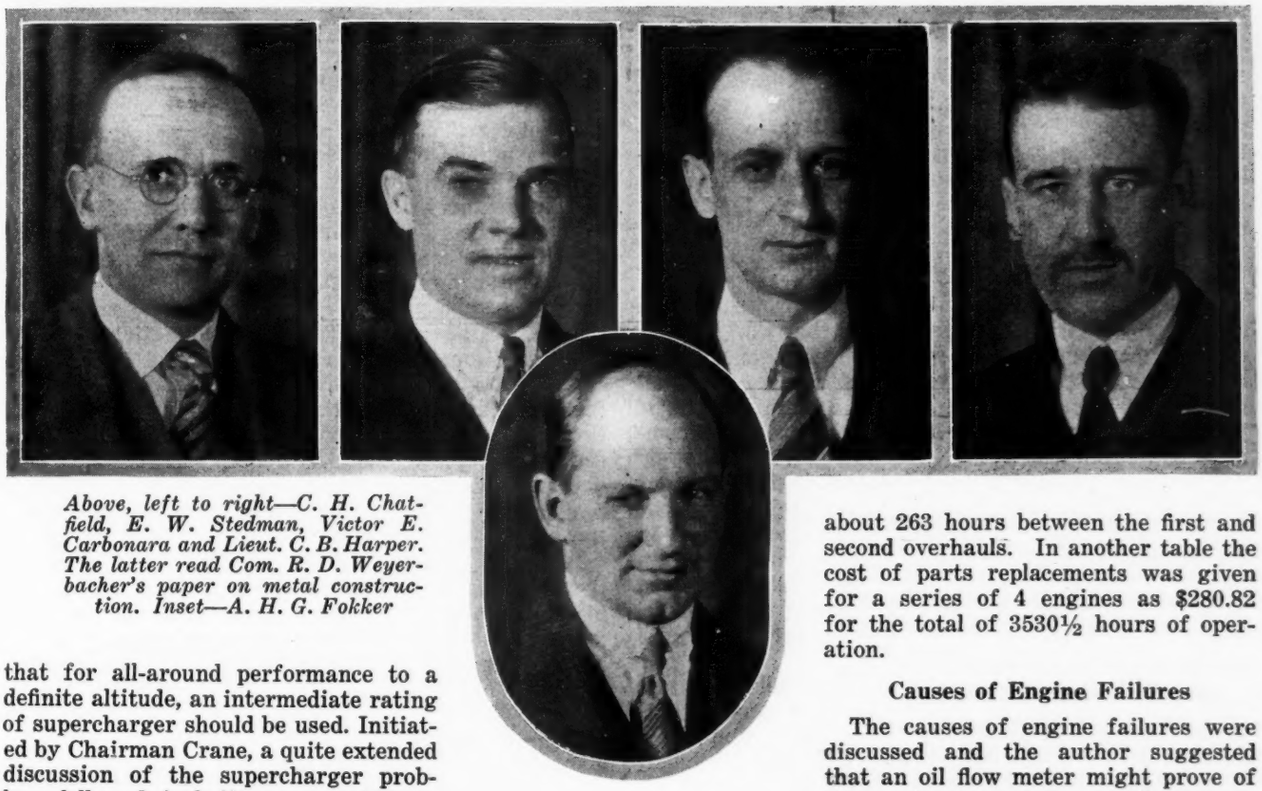
Com. Stedman's paper recited the development of regulation of aircraft construction by the Canadian Government and stressed the necessity of extending control beyond the initial construction to include maintenance of the aircraft while in service. He cited as an example the case of a flying boat the structure of which failed in the air. Examination of the wreck showed that some of the structural members had deteriorated under fittings where detection by visual examination was precluded. The author referred to the strength requirements of the Canadian Government as based upon the recommendations of the International Commission for Air Navigation and called attention to the fact that these recommendations were intended to provide minimum design figures. Many engineers, it appeared, considered the values more as recommended practice instead of working with values sufficiently above them to provide a high standard of design.

In concluding, the author asked for suggestions regarding policies to be pursued in the control of aircraft design and suggested that there might be some advantage in abandoning any attempt to vest such control in Government agencies. As an alternative, he suggested for consideration the policy of requiring that all aircraft carry insurance, hence throwing upon the insurance companies the burden of design control.

Cost on the Operators

In the discussion of Com. Stedman's paper several made reference to this closing suggestion and it was pointed out by some that the compulsory insurance policy would throw the cost of the inspections upon the operators instead of this being carried by the Government as at present. In the discussion of both Stedman's and Young's papers some mention was made of the difference between insurance inspection and Government inspection. Among other considerations it was suggested that the insurance firms would not be content to accept a Government approval which might have been given a few months previously but would want a report made by engineers of their own selection and as recently as possible. Mention was also made of the fact that insurance firms frequently include with their inspection report an appraisal of value.

In his paper on Supercharged Engine Performance, Calculated and Actual, Opie Chenoweth outlined a method of predicting the power output of a given aircraft engine when equipped with a gear-driven centrifugal supercharger. For the purpose of selecting the one giving the best all-around performance, three superchargers of different ratings were considered. In assigning ratings the weight, compactness, reliability, simplicity and general arrangement were considered. In a series of several curves the author showed the effect of superchargers of various ratings upon engine performance. Tests of a Curtiss D-12 engine were conducted in the altitude chamber of the Bureau of Standards at Washington and the results of these tests compared with the calculated data. The author concluded



Above, left to right—C. H. Chatfield, E. W. Stedman, Victor E. Carbonara and Lieut. C. B. Harper. The latter read Com. R. D. Weyerbacher's paper on metal construction. Inset—A. H. G. Fokker

that for all-around performance to a definite altitude, an intermediate rating of supercharger should be used. Initiated by Chairman Crane, a quite extended discussion of the supercharger problem, followed, including some reference to the relative merits of the geared type.

Even a casual perusal of the preprinted copies of C. H. Biddlecombe's paper on the Wright Whirlwind engine showed that it contained sufficient material to initiate a most extended discussion. It therefore seemed regrettable that the full program of the Thursday afternoon session tended to somewhat curtail discussions on each of the papers, covering, as they did, subjects not closely related to each other. Starting with a recital of the conditions of operation under which the observations were made and following with a general description of the engines, the author followed with some interesting figures on maintenance practices and costs.

RUNNING TIME OF 17 WHIRLWIND ENGINES

Engine No.	Total Time Hr.	Min.	First Overhaul Hr.	Min.	Second Overhaul Hr.	Min.	Third Overhaul Hr.	Min.
6955	366	57	366	57				
6962	403	25	301	14	Destroyed—Hangar Fire			
6964	351	25	277	14	Destroyed—Hangar Fire			
6965	753	16	302	30	401	55	567	48
6966	688	16	254	36	589	31		
6967	530	17	197	05	247	20		
6968	680	20	356	35	680	20		
6975	447	30	331	50				
6979	523	40	383	46				
6982	837	25	276	37	633	00		
6995	891	05	389	28	716	48		
7006	276	00	251	15				
7220	635	10	241	45	635	10		
7221	238	55						
7230	286	50	286	50				
7240	292	10	292	10				
7245	297	35	193	05				

Average time to first overhaul, 293 hr. 56 min.
Average time to second overhaul, 557 hr. 43 min.
The average for the second overhaul was obtained for seven engines only. The true average probably was higher.

From the table on overhauls covering a series of 17 engines it was noted that the period of running averaged almost 300 hours before the first overhaul and about 263 hours between the first and second overhauls. In another table the cost of parts replacements was given for a series of 4 engines as $280.82 for the total of 3530½ hours of operation.

Causes of Engine Failures

The causes of engine failures were discussed and the author suggested that an oil flow meter might prove of more advantage than an oil pressure gage. In support of this contention he cited a case of engine failure in which an oil flow line became obstructed with resultant failure of a bearing although the oil pressure was maintained at a normal value and the oil thermometer gave practically no advance motive of the trouble. Part of the paper was given to consideration of the relative cost of operating single and three-engined airplanes using the Wright Whirlwind engines and the author concluded that (for the conditions estimated) an idle tri-motor airplane cost about three times as much as an idle single-motored one. In operation he estimated (again for the particular conditions considered) that the flying cost of the tri-motor type would be about $0.67 per mile and for the single motor type $0.33 per mile, in each case excluding overhead charges. Allowing for overhead costs he estimated the rates as $1.18 per mile and $0.87 per mile for the tri-motored and the single-motored type respectively. In his review of the operating conditions the author also included reference to and some description of the forms used in keeping records and the maintenance practices applied. The specifications under which gasoline was purchased were similarly included and experiences with aviation gasoline and commercial treated gasoline compared.

The aircraft industry is in close touch with the requirements of the Army and Navy, largely because it has, up to the present, made use of engines and aircraft designs developed in conjunction with the services, Secretary Warner pointed out in his paper on the Application of Non-Military Aircraft to Naval Purposes. But with the increasing development of commercial types, he continued, the industry has to some extent taken a divergent course, because commercial and military aircraft are quite distinct in most instances.

Each group has its special characteristics, and as groups they are sufficiently alien to each other so that it is not easy to produce both in a single shop. In time of emergency, however, it would be comparatively

easy to turn to military airplanes.

For the military combat machine there is no commercial analogy and almost the same thing is true of the fast observation types. The structural strength must be so great and the problems of their construction are so largely those of installation of equipment specifically military as to leave their design necessarily somewhat remote from that of any plane intended for commercial employment.

Concentrate on One Type

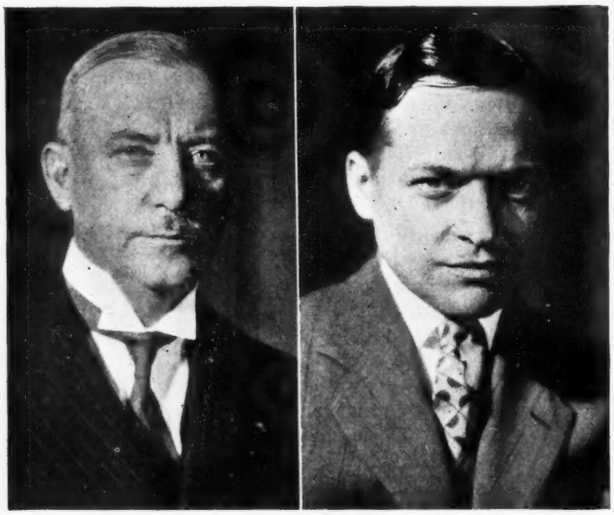
Although the point was not definitely brought out in his paper, Mr. Warner made it plain that the commercial designer and producer might better go ahead with the development of planes best suited to the commercial services for which there is need, as there is little if any chance of producing a type efficient for both commercial and military uses.

For heavy bombing service, however, certain types of commercial craft may prove to be adaptable with but minor modification. There has been evidence of it in the deliberate construction in more than one European factory of airplanes of which only the fuselage, or even nothing but a detachable central section of the fuselage, needed to be changed to convert a passenger carrier into a satisfactory bombing craft.

Such a machine, however, is always likely to be less than fully satisfactory in its military employment. Aerial bombing frequently has to be carried on under conditions so arduous that nothing less than the maximum of possible efficiency and performance is to be accepted, and the factors that govern efficiency as a bomber are so numerous and are interlocked so closely that it is difficult to incorporate them in an assembly with another set of governing conditions in mind.

For the specific purposes of naval aviation, the desirability of ready conversion from landplane to seaplane or of provision for arresting motion on a carrier deck, or both, together with the extreme importance of minimized dimensions on an airplane that is to be carried on shipboard, are unlikely to receive even passing attention in a commercial layout, and indeed could not well be considered without loss of commercial efficiency.

One specifically naval type of airplane offers a somewhat brighter picture. Those characteristics which make the most efficient flying boat for patrol duty make also, with but little change, the most satisfactory boat for passenger service. When we in America finally awaken to the importance of the flying boat, and when our urgently-needed flying boat industry is finally resurrected, it requires no special gift of prophecy to foresee that it will be constructing machines for naval and for commercial use side by side, and that there will be almost complete identity between the two, except in certain features of interior arrangement of hull.



Gen. J. F. O'Ryan (left) and Charles H. Colvin. Both were on the program of the Metropolitan Section meeting

In war, Secretary Warner declared, essential transport lines for mail, freight and passengers, throughout the country and near the scene of battle, would be maintained and production for these purposes would be unimpaired, as a necessary part of the national defense.

An additional very important utility of the commercial aircraft industry would be the rapid construction of training planes for the first course of the budding wartime flyers. Some minor modifications in the commercial types would be made so that the transition to combat types would not be too drastic and the patriotic commercial producer should familiarize himself with the possibilities along these lines.

A. H. G. Fokker launched into the heart of a controversial subject when he declared that two-engined planes able to continue flight with full normal load after one of the engines have stopped "practically do not exist." He pointed a distinction between the first test flight of such a plane, with engines, propellers, etc., at highest efficiency, and later service. The ability of a two-engine ship to fly on one engine is not proven if such a ship is able to fly for a short while on one engine, but it must develop sufficient reserve and be able to run on one engine for at least a few hours without overheating or over-straining.

Paying Load Reduced

He said he had built and demonstrated several types of two-engine ships but to enable them to fly under the conditions given, for a long period, would necessitate a reduction of paying load to such an extent that it could not be operated economically. Twin-engined ships used for military purposes, where the excess load can be dropped at any time if it is necessary to continue on one engine, is a different and reasonable proposition.

Issue was taken with these statements in the ensuing discussion by I. I. Sikorsky, who said there were many instances where two-engined planes had satisfied the requirements reasonably well. He predicted their use in commercial passenger carrying enterprises over routes not longer than a few hundred miles.

It is still even very difficult, Mr. Fokker continued, to produce a three-engined plane which will be able to continue safe flight with one engine dead. Many people live under the illusion that if one engine stops in flight on a twin-motored plane, 50 per cent of the horsepower is left for the purpose of flight and similarly two-thirds of the power in a three-engined plane. If the Fokker Trimotor for instance, has propellers which will turn up 1800 r.p.m. at 220 hp., at full speed with all three engines going, the remaining two, if one is stopped, will only turn up slightly over 1700 r.p.m. Therefore, we have only a total of 370 hp. left instead of 440, as the failure of one out of three would lead up to believe. In the two-engined plane, the situation is worse. Not more than 40 per cent of the power would be left with one engine stopped.

In the two-engined plane, furthermore, the turning effect of the single engine remaining in service is much greater than with a three-engined plane with two engines operating, and consequently the methods and devices used to overcome the turning forces greatly add to head resistance.

In the case of the arrangement of two powerplants used on some flying boats where one is located behind the other, this disadvantage, due to turning forces when one engine stops is, of course, non-existent. However, the loss of efficiency of the propellers and the resulting reduction in the speed, the increased head resistance of the non-driven propeller and the motor, provide us with the same problem as on any other twin-engine airplane. The entire solution of this propeller problem in multi-motored aircraft, no matter which arrangement of engine is used, lies in the use of variable pitch propellers, of which the pitch can be adjusted by the pilot. This is, however, a weighty complication.

The multi-engine principle must be considered to be an insurance against a forced landing due to failure of one powerplant. This insurance cannot be obtained for nothing; it costs more fuel consumption and more head resistance, if the insurance is to be a good one. Therefore, intrinsically, a single-engine ship of the same design and power, as far as possible, is bound to have a longer range.

Cost is Too High

In view of the relatively higher operating cost, I do not believe that it will be worth while to bother about the three-engine principle in the smaller, relatively cheaper aircraft, as the amount of possible damage is less with the small machine than with the big heavy one. The large investment in big planes justifies the higher cost of insurance provided by the multi-engine principle, more than on a low-priced airplane, where the higher operating cost of three powerplants would be out of proportion with its pay load.

In the course of the discussion Capt. Biddlecombe, who has had commercial operating experience with both single and multi-engined planes, implied that the safety features of the latter had been somewhat overrated. Most of the forced landings, to an overwhelming extent, were due to weather conditions rather than engine failure and the difficulty of landing a large three-engined ship under poor conditions was much greater than in the case of the smaller and more readily maneuverable craft.

Prof. Chatfield, comparing biplanes and monoplanes, pointed out that the tendency toward metal construction of wings has been accompanied by a noteworthy increase in the proportion of monoplanes. In structural efficiency the biplane is considered superior both in strength-to-weight ratio and rigidity, but the latter point was opposed by Mr. Stout, who declared that wing flutter has been completely eliminated in some designs of metal wings.

Urging New York to carry through a program for a municipal airport, Secretary MacCracken said at the Metropolitan Section meeting of which Charles W. Colvin was chairman, that the Federal Government has decided it is not going to maintain airports. The Department of Commerce will carry on the maintenance of airways, their lighting and development, but the airports themselves must be developed and maintained either by the municipality or private interests.

The importance of a large airport in New York to the rest of the country, he said, is recognized, but he added that this would not warrant special governmental aid. Touching on the national importance of a New York airport, he said that the continued failure to develop a field in the Metropolitan District in time would stifle commercial airport transportation throughout the country.

Speaking somewhat on the same subject, General John F. O'Ryan, Colonial Air Transport, Inc., emphasized the need of special planning for airports for air transportation routes. Fields that might be suitable for ordinary flying would not meet the needs of a service which must operate in all kinds of weather.

Alex Klemin (left) and F. C. Hingsburg. The latter is chief engineer, Airways Division, U. S. Department of Commerce

A point made by Secretary MacCracken was stressed by William E. Arthur, William E. Arthur & Co., in discussing the design and construction of airports. He recommended that the runways be as long as possible, not under 3000 feet, and free from obstructions at each end. Care should be taken that the buildings, telephone wires or other obstructions are not in direct line with the runways. Wires in proximity to the field always carry an extra danger and if they should happen to be transmission lines, carrying a high voltage, the danger is increased. In wiring the fields, all wires should be carried underground.

John Nolen, landscape architect and city planner, Cambridge, Mass., said that perhaps it is on the whole better that a full sized airport must be placed on the outskirts of a city. Even railroads no longer seek to place their terminals in the heart of a congested district.

Papers on airport lighting by H. E. Mahan of the General Electric Co., and P. R. Bassett of the Sperry Gyroscope Co. were presented on Wednesday evening, when many of the members made an inspection trip to Hadley Airport.

Frederick C. Hingsburg, chief engineer, Airway Division, Department of Commerce, reported that 4120 miles of national airways have been lighted to date, and the lighting of 3400 additional miles is contemplated for the next year.

Of two papers on oversea navigation, presented at the Wednesday afternoon session at which W. L. LePage, Pitcairn Aviation Co., was chairman, the first was by Lieutenants Albert Hegenberger and Bradley Jones, Army Air Corps, Wright Field. Victor E. Carbonara, Pioneer Instrument Co., read the papers. Out of his experience with the army flight to Hawaii, Lieut. Hegenberger was able to give a thorough understanding of the many difficulties of aerial navigation under such conditions. The operation of present-day navigation instruments and reduction of the observations are by far the most difficult functions that are performed in the air. Because of the mental gymnastics involved, these observations never become instinctive as does piloting. Fatigue reduces mental efficiency tremendously during long flights and serious errors may thereby be made.

British Demand *is for* Smaller Engines, *Roomier* Bodies

At least that is situation as sized up by manufacturers and reflected in designs of leading makers at Olympia.

By M. W. Bourdon

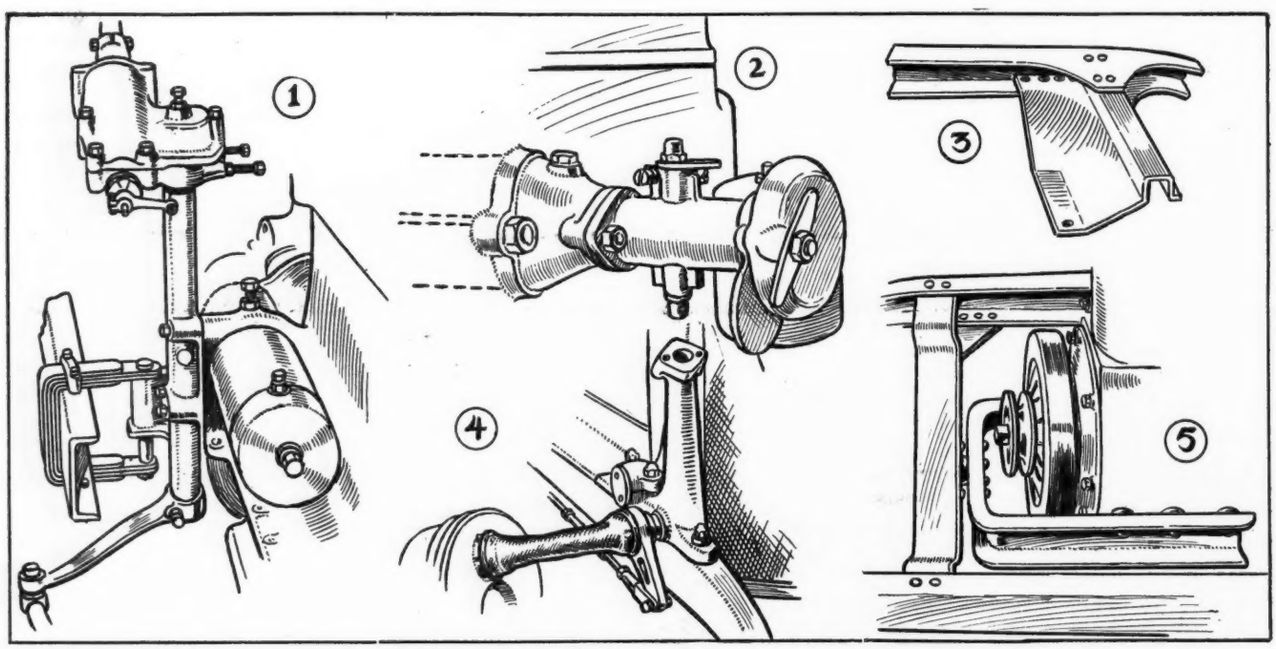
THE outstanding point concerning British cars for 1928 is that, of 22 entirely new models, 12 have six-cylinder engines all of less than three liters (183 cu. in.) piston displacement. The remaining 10 new models consist of eight fours, an eight and a 12. Six of the fours have cubic capacities of less than 1½ liters (91½ cu. in.) or thereabouts, one is less than 2½ and the other under 4½.

For the first time a line of demarcation representing the limit of size in four-cylinder engines for new models of the near future has become apparent, viz.: about 1½ liters, while the popular type of six will certainly be less than 3 liters. The two new fours for 1928 of more than two liters are exceptional; they are a high-efficiency 4½-liter Bentley and a 2.4-liter Bean, and the example of their makers in producing them is not likely to be followed in the future.

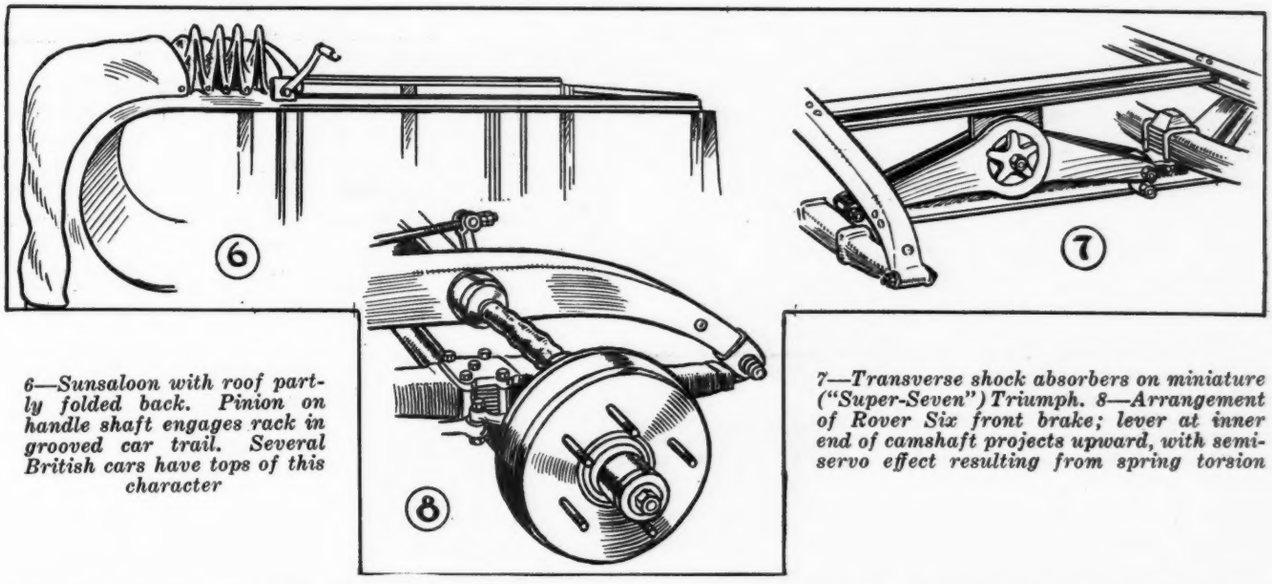
Hitherto there have been only isolated examples of sixes of popular size (1½ to 2½ liters), but this year there are 10 additional ones, and if "popular size" in sixes is more closely defined in the future it will probably be restricted to engines of 1½ to 2 liters, representing, roughly, the size that was most popular in fours until recently.

The foregoing does not mean that the British cars most likely to secure the biggest outputs in the near future will be these small sixes, for there is every indication that fours ranging from 1 to 1½ liters, or approximately of less than 100 cu. in. displacement, will continue to be in greatest demand. In fact, the really "popular" size of car is decreasing in engine size, irrespective of cylinder numbers, and unless the signs and portents of 1927, as represented by the increasing outputs of such small fours as the Austin and Singer, are at fault, the biggest demand will center about a four-cylinder four-passenger car, open or closed, with an engine of less than 75 cu. in. capacity.

The Morris program for 1928 affords two striking signs of current tendencies, for besides introducing a light six, he has a new four that consists of his smallest



1—Leaf spring engine bearer and arrangement of steering gear at rear end of engine on Rover Six. 2—Bifurcated union between carburetor and dual induction passages across Bean "14" four-cylinder block. 3—Front cross member with extended web to support engine on 9 hp. Standard. 4—Radiator trunnion bearing, lamp bracket and brake camshaft are composite unit in cast aluminum on 1½-liter Bentley Four. 5—Front end support of engine on eight-cylinder Wolseley. Projection from U-shaped bearer has support in rubber-lined trunnion bearing attached to frame



6—Sunsaloon with roof partly folded back. Pinion on handle shaft engages rack in grooved car trail. Several British cars have tops of this character

7—Transverse shock absorbers on miniature ("Super-Seven") Triumph. 8—Arrangement of Rover Six front brake; lever at inner end of camshaft projects upward, with semi-servo effect resulting from spring torsion

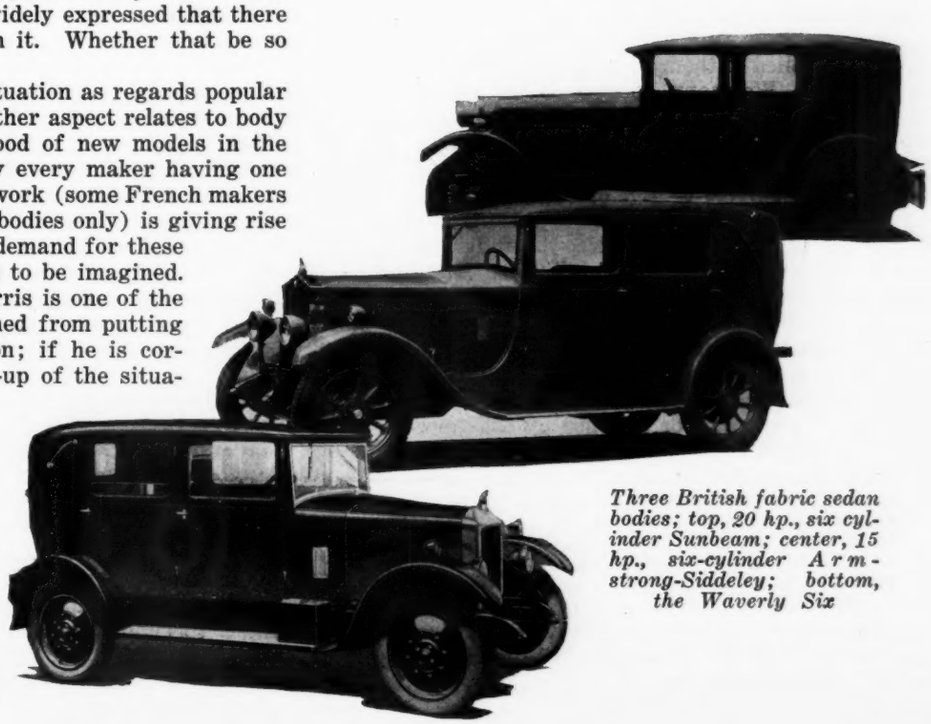
four-cylinder engine (Cowley model) in the chassis and with the bodywork used hitherto only for his medium sized (14 hp. Oxford) four. His explanation of this move expresses the situation in general quite clearly, viz.: there has been an increasing demand for the smaller engine in a chassis suitable for the roomier bodywork. Buyers are wanting even greater economy than hitherto in running costs, insurance and tax dues, with no less seating accommodation, and some of the small fours, with engines of under 75 cu. in., give them quite as much in seat space and legroom as the 100 cu. in. models that have been the most popular hitherto.

With regard to the large number of new small sixes now on the British market (the home-products being supplemented, it must be remembered, by new models of similar size and type from France, Belgium and Italy), many people, including the executives of some of their makers, are fearing that the demand will fall far short of total projected outputs. The market for this type, at present anyhow, had fairly well-defined limitations, and the view is widely expressed that there are too many makers now in it. Whether that be so remains to be seen.

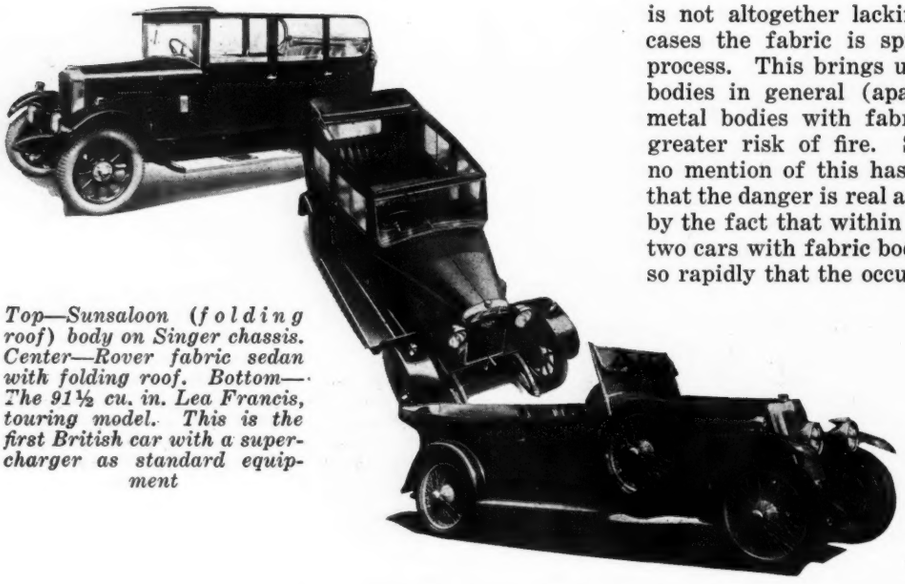
So much for the general situation as regards popular chassis sizes and types. Another aspect relates to body types, and here again the flood of new models in the form of fabric sedans, nearly every maker having one in his range of standard bodywork (some French makers at Olympia exhibiting fabric bodies only) is giving rise to wonder as to whether the demand for these will be as extensive as seems to be imagined. It is worthy of note that Morris is one of the few makers who have refrained from putting a fabric body into production; if he is correct in his implied summing-up of the situation, a great many other people are wrong, especially those who are offering no sedan except the fabric type.

Sedan bodies are undoubtedly displacing the open car with folding top and rigid side screens, and some makers of popular types of cars—to say nothing of the more expensive types—are anticipating that demand in 1928 will call for 70-80 per cent of sedans. Prices of open and closed models have come closer again this year, the average difference being in the region of 14 per cent. It is probable, however, that, in cars selling for less than £250, open models will still represent between 40 and 50 per cent of the aggregate output.

It is to be noted in this connection that three makers of exceedingly popular small cars, Singer, Standard and Rover, have put forward sedans that can be opened, as well as another with a fixed roof. The Singer rendering is known as the Sunsaloon and is not exclusive to Singer; it has a light but rigid side framing for the doors and either glass or celluloid drop windows, and a flexible (leather substitute) roof that can be wound forward or concertina'd neatly behind the rear passengers by a small detachable crank handle which engages with the end of the shaft in the front cross member. At each end of the shaft is a small concealed sprocket that travels along a rack formed by a length of roller chain lying



Three British fabric sedan bodies; top, 20 hp., six cylinder Sunbeam; center, 15 hp., six-cylinder Armstrong-Siddeley; bottom, the Waverly Six



Top—Sunsaloon (folding roof) body on Singer chassis. Center—Rover fabric sedan with folding roof. Bottom—The 91½ cu. in. Lea Francis, touring model. This is the first British car with a supercharger as standard equipment

in a groove in the top of the side framing. The price of this body comes midway between the open type and the sedan.

The Standard and Rover rendering is the normal fabric sedan but with three-quarters of the roof capable of being folded back into an envelope on the fixed rear portion, somewhat after the manner of the folding top of a phaeton. The offer of this as an alternative to the fixed top sedan is an indication that, despite the undoubted popularity of the latter with the Rover in 1927 (demand exceeding output at one part of the year), there is still dissatisfaction with the sedan among many British buyers—they still crave for "roofless motoring" in fine weather.

The sliding roof sedan no longer appears as a body model in the range of Standard cars, as last year, but it has representatives at Olympia, where, too, are many new examples of closed cars that can be opened, as distinct from open cars that can be closed.

The fabric sedans that have been standardized by car manufacturers and those offered by body-builders vary extensively and fundamentally in the constructional methods applied to them. Not more than 10-15 per cent embody the Weymann conception of flexible air-gap joints for the framing and seats all supported directly by the floor, the latter attached to the chassis. The majority have rigid joints and a good deal of paneling at the rear quarters to give curvature, while not a few are merely ordinary sedan frames entirely covered with either metal or plywood panels, the fabric simply displacing paint and varnish, or cellulose. The latter examples, of course, are not fabric bodies at all, as usually conceived; they are fabric-covered bodies, and apart from the assumed greater durability of the fabric they have no advantages whatever over ordinary sedans, being just as prone to creak, drum and have their joints permanently strained or loosened by chassis frame distortion. They are not lighter; their frames are made to carry passenger weight, though loose driving seats relieve them from that stress at the front.

The sombre hues originally associated with fabric bodies have given place to a big variety of bright colorings and in many cases the superstructure is of a different tone of the same color, or of a different color altogether from the body below the waist line. Distinctively colored narrow moldings are also used to brighten the general effect, compensating for the lack of gloss. The latter is not altogether lacking, however, for in not a few cases the fabric is sprayed with cellulose as a final process. This brings up a point concerned with fabric bodies in general (apart from those that are merely metal bodies with fabric instead of paint), viz.: the greater risk of fire. So far as the writer is aware, no mention of this has yet appeared in the press, but that the danger is real and an additional one is suggested by the fact that within the writer's personal knowledge two cars with fabric bodies have caught fire and burned so rapidly that the occupants had narrow escapes. One was undoubtedly due to the exhaust pipe being too close to a fabric panel, but why the other suddenly blazed up and like the first burnt out in a few minutes has remained an unsolved mystery. One suggestion is that a spark from a passing steam truck was responsible.

Bodywork in general, open and closed, includes adjustable front seats, 70 per cent of the latter being separate units, and in a few instances (many in fabric bodies) the angle of the back rest is adjustable, too. Pneumatic upholstery, after hanging fire for several years, has been adopted by nearly a dozen additional makes, for all bodies in some cases, for certain tyles in others. Builders of custom bodies show many cars thus equipped.

Fabric bodies have both real leather and leatherette coverings, leather, in the case of custom bodies being from £7 to £10 higher in price. Grained fabric is usual, but there are examples of smooth surfaces. Engine hoods are not always fabric covered, about 50 per cent being cellulosed, or dull painted and rolled to give a graining effect.

Two-piece crankshaft of new Wolesley eight. Helical bevel drives overhead camshaft

The single panel front screen is found on a large number of British sedans. Usually it is hinged at the top with a quick-action and locking central control at the bottom. Rarely is it fixed, though that occurs in one case (the Riley fabric sedan) with a ventilating slot at the top running the full width; the slot (about 1½ in. deep) is normally closed by a hinged flap with a flexible strip abutting the screen frame, but it can be opened and the flap held up by a neat central lever. In no case is a screen fitted with a vertical movement on a standard body, but a custom body builder has a two-panel screen of which the top section is fixed and the bottom slidable upward. Another body builder has developed a window for the driver's side that is made both to lower and slide, the latter feature to facilitate the giving of traffic signals.

There are quite a number of bodies, mainly on small cars, with foot wells for the rear passengers, these usually extending under the front seats. They are used either to enable a short chassis to accommodate four adults in comfort, or to permit the seat and therefore the roof height to be reduced.

Cellulose finish is not yet universal on metal bodies, even for low-priced cars, but it is found on many more makes than last year.

Turning now to chassis design, a notable trend is toward the readoption of side valves. For the first time since the war, almost 50 per cent of new models have L-head engines, and when the new models at Olympia are classified irrespective of nationality, and even ignoring American products, the majority of them are found to have side valves. Ricardo is undoubtedly responsible for this; not that all or even the majority have Ricardo heads, though they may be styled semi-Ricardo. The Bean is the only new British model entirely in accord with Ricardo conception.

Volumetric Efficiency

Pushrod operated overhead valves on normal production engines for private passenger cars appear to be at no great advantage in respect of volumetric efficiency when compared with these new side valve engines, unless, as in the case of the Riley Nine, two camshafts, or other means of providing for two rows of inclined valves in a hemispherical combustion space, are used.

The British public does not demand overhead valves, otherwise Morris, Clyno and Austin between them would not have been able to sell more cars (all with L-head engines) than all other British makers put together. All that is needed by most buyers is a reasonably high standard of efficiency and economy, and they are given that with side valve engines that cost less to produce, other thing being equal. It is worthy of note, however, that Morris, who has used side valves exclusively hitherto, has produced a new six with an overhead camshaft; but the latter is used to provide two rows of valves.

Six new British models out of 22 are fitted with battery ignition, while two of the remainder have battery and magneto; this is worthy of note because when two or three makers attempted to use it three or four years ago they were compelled to revert to the magneto by force of public demand. Probably the fact that the small (102 cu. in.) Talbot Six introduced at last year's show with battery ignition has been so well received accounts for other makers venturing to fit it on new models this year.

A great deal of experimental work on induction systems has been done during the past 12 months and has resulted in variations being made in continued models. Only Bean has a dual tract for four-cylinder engines, and not all revised or new models embody the straight manifold of rectangular section favored by the majority of designers. There is, moreover, no general trend in induction layouts or vaporizing systems apart from straightening up of manifolds with branches leading off at right angles. For six-cylinder engines there are single carburetors leading into the center of straight-through manifolds or to manifolds divided in various ways; dual carburetor outlets to two three-branch manifolds; two separate carburetors with separate manifolds, and other combinations. The general impression is that there is a lot yet to be learned by most designers about induction tracts and vaporizing. The new Morris is the only new British Six with a cast-in induction manifold, differing from the current trend as in value position.

The silent chain for distribution has lost a lot of ground, its place being taken by helical gears—non-metallic usually on the camshaft—and, latterly and to a marked extent, by roller chains, either single or twin. A tandem drive for the generator and magneto with a triangulated roller chain and an idler sprocket, or by a train of gears, has become common practice only isolated cases occurring of the generator driven from the front end of the crankshaft. There has been no reversion to a belt drive for the generator.

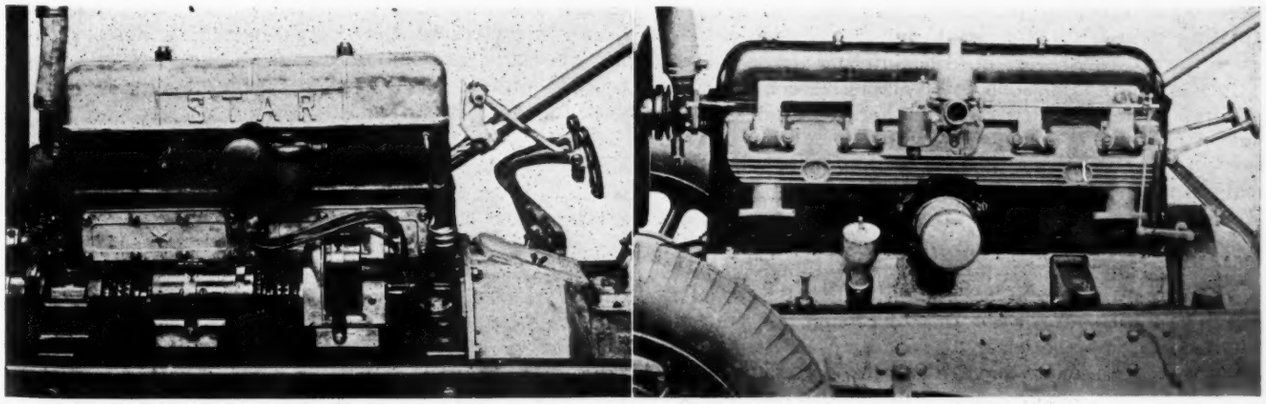
In crankcases there is a very pronounced trend to carry the upper half (integral with the cylinder block) several inches below the crankshaft center line and to use bushes for front and rear journals instead of split bearings, the rear bush being housed in an end plate and split bushes for intervening journals. The new sixes have bearings of various numbers, from four, as in the new Rover, to nine in the new Vauxhall. Those two makes are in company with several others—Morris included—in having no counterweights for the crankshaft, and not all have torsional vibration dampers.

Full Pressure Lubrication

Full pressure lubrication is increasing, appearing even on the smallest of new models, the 50 cu. in. Triumph Four (the latter distinctive in having a three-bearing crankshaft) and the 70 cu. in. Standard.

Cone clutches are at last disappearing, only two of 22 new models having them; unit-constructed powerplants are by way of being universal; 14 of the 22 new models have four speeds and six have worm drive. Fabric joints for the propeller shaft are losing ground, several makers having adopted the Spicer joint for new or continued models.

There is no change to record in rear axle construction; springs are nearly all half-elliptic, only one new model having cantilever springs at the rear and one quarter-elliptic. Four-wheel brakes are practically universal on

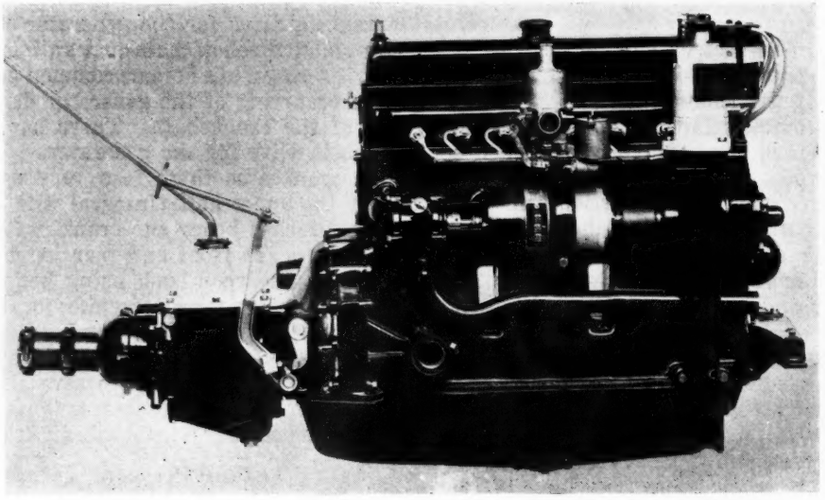


Left—Powerplant of six-cylinder Star. Cylinder block has separate levers of special grade of cast iron. Right—Left side Wolesley eight-cylinder engine

British cars and the usual scheme embodies four sets of expanding shoes, of which the rear ones are actuated by the hand lever and all four by pedal. In isolated cases of new models there is a transmission brake for hand operation or an extra set of shoes in the rear wheel

Brakes have been improved in regard to ease of operation by the reduction of bearing friction arising so often hitherto from the distortion of cross-shafts. One result of this improvement is the very noticeable slowing-up of the adoption of a vacuum servo; in fact, in certain cases it is not now offered where it was available last year. True, it is being offered for the first time in other cases, but there is no evidence of the trend toward the widespread, almost universal, provision of a servo device for cars of more than 12-14 hp. that appeared to be imminent last year.

Engine speeds of new models are on a higher plane than hitherto, ranging up to and even over 4000 r.p.m., with the result that there is a general tendency toward lower back axle gear ratios, so affording a better top gear performance with the same maximum as before. There are many examples of ratios of more than 5 to 1 with engines of anything from 50 to 150 cu. in. capacity or more. The new Morris with a 4.42 to 1 back axle ratio is the highest geared of any new six.



Powerplant of the new Morris six with overhead camshaft. Points of note in this view are the tunnels through the crankcase, the exterior tubular casing of the magneto and oil pump driveshaft, the vertical megneto mounting, the position of the water pump and the trunnion bracket for the steering gear box

The only unorthodox features in new British models are the over-running clutch in the transmission of the Lea-Francis and Vulcan cars and the provision (optional) in the same makes of a supercharger. There are no separately sprung wheels or duplicated steering equipments as there were in some French cars exhibited at the Paris Salon. British makers in general are more concerned with cheapening production and meeting the demand for economy in upkeep, etc., than in devising startling new features; naturally, therefore, they are prone toward conservatism in design and the avoidance of fundamental variations in principles of construction.

Morris alone among British makers held back information concerning a new six-cylinder model until the opening of the show, though he had previously announced a new four consisting of the 11.9 hp. (Cowley 94 cu. in.) engine in the Oxford 107-in. wheelbase chassis and fitted with Oxford bodywork, which is roomier, of higher grade and better equipped than the Cowley range. The object of the additional model is said to be a demand for the greater economy in running of the Cowley engine with the roominess of the Oxford bodywork. The following are interesting comparisons of prices:

	11.9 hp. Cowley	11.9 hp. Oxford	14 hp. Oxford
Phaeton	£170	£205	£225
Sedan	185	215	250

The new Morris Six has an overhead camshaft engine of 2½ liters (152½ cu. in.), magneto ignition, four-bearing crankshaft, pressure lubrication, single-plate cork insert clutch running in oil, three-speed unit constructed gearset with central control, inclosed propeller shaft, 4.42 to 1 spiral bevel drive and half-elliptic springs, underslung at the rear. For the home market the chassis has a track of 48 in., the wheelbase being 114 in., but for export a 56-in. track is offered. The car with a four-passenger phaeton body is £320, the all-metal duotone cellulose sedan being £350, both of which are low figures for a 2½-liter six on British price standards. The price is sure to give the car a substantial market.

The cylinder block and crankcase construction is of note. It is a cast iron unit, extending well below the center line of the crankshaft (which incidentally, has neither counterweights nor a torsional vibration damper, but is machined all over). Observed from either side, there are two "tunnels" passing completely through the crankcase, immediately over the two middle bearings of the crankshaft; these are provided to stiffen up the crankcase, affording a box-girder effect and enabling bolts to be used for the crankshaft bearing caps instead of studs, the bolt heads being visible within the tunnels.

Another point of note is that, with the exception of three flanged hand-holes for distribution assembling, the whole of the front end drive casing is integral with the cylinder block and crankcase unit, which again enhances rigidity. The distribution consists of a dual roller chain passing around four sprockets, i. e., (1) on the crankshaft, (2) an automatic tensioning idler, (3) on the generator and water pump driveshaft, and (4) on an intermediate shaft of the camshaft drive. This intermediate sprocket has attached to it a straight-toothed pinion meshed with a non-metallic half-time gear on the camshaft.

The generator and water-pump driveshaft carries a skew gear near its front end for driving a long vertical shaft in a tubular exterior casing, at the top of which is the flange-fixed magneto with its armature shaft vertical and at the bottom the gear type oil pump. The magneto has both automatic and hand control for the timing. A single carburetor is used (an S. U., constant vacuum type) flange-fixed directly to the center of a straight manifold integral with the detachable cylinder head, the exhaust outlets and their ribbed separate manifold being on the opposite side with a central downtake.

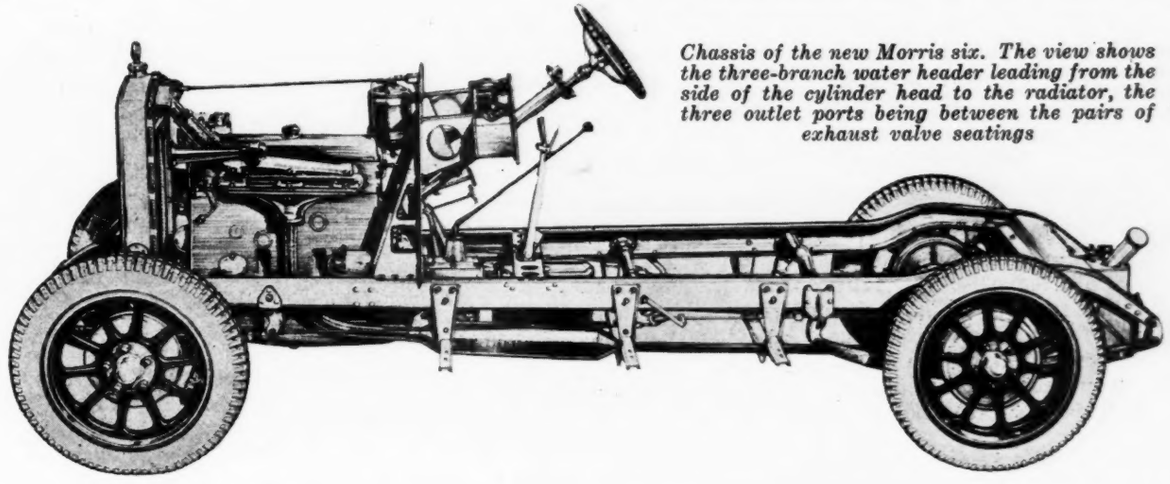
The combustion chamber is machined all over and

the valves—all of the same size and of silchrome steel—project at opposed angles. Valve operation is effected by a centrally located four-bearing camshaft, immediately below a hollow shaft for bell-crank rockers with spatula ends that bear upon the cams; clearance adjusting screws are provided for the valve stem contacts. Pressure lubrication occurs throughout and oil is fed between each cam and its spatula.

Aluminum pistons with straight sides and three rings have been adopted; the wrist pins are clipped in the small ends of the steel connecting rods, which are machined all over. The generator and water-pump are in tandem, the pump being of the Archimedean screw type and delivering to the rear end of the cylinder block on the right; thence the flow is around the jackets to the head, which has three outlets to the header branch on the left, these outlets occurring between the pairs of exhaust valve seatings. For the home market a fan is not fitted. The spark plugs are horizontal on the inlet side.

sedan being offered at the same prices. The five-passenger phaetons are £320 and £360 respectively.

The new engine has a semi-Ricardo head, magneto ignition with automatic timing (a feature introduced into all Armstrong-Siddeleys for 1928), four-bearing crankshaft, dual roller chain distribution with exterior eccentric adjustment for an idler sprocket, and pump water circulation, the pump being driven from the front end of the shaft for the tandem drive of generator and magneto on the right and having a spring-loaded gland. No fan is fitted, the steel flywheel having vaned spokes extending radially from the clutch casing. Lubrication is by a gear type submerged pump delivering to all main bearings. A Claudel carburetor with gravity feed is used attached to a six-branch manifold of rectangular section, which has a flanged connection with the exhaust manifold over the central stem to form a hot spot. The exhaust downtake is at the front end. The engine has a four-point suspension with a limited degree of flexibility in its flat steel brackets. Cylinders and the upper



Chassis of the new Morris six. The view shows the three-branch water header leading from the side of the cylinder head to the radiator, the three outlet ports being between the pairs of exhaust valve seatings

The engine develops 18.5 b.hp. at 1000 r.p.m. and 52 b.hp. at the peak of its power curve, viz.: 3200 r.p.m. It is unquestionably a high-grade job and runs with remarkable smoothness; it has long passed the experimental stage and the new chassis is well in production, deliveries being promised at the end of October, if not earlier.

There is nothing unorthodox about the chassis and transmission, which follow the lines of the four-cylinder Morris cars. The four-wheel brakes have direct mechanical actuation by pedal, a separate pair of shoes in each rear wheel drum being operated by the hand lever. The drums are all of 12-in. diameter, the rear ones being fitted with clipped-on and deeply ribbed aluminum exterior rings for cooling. There is compensation between the front and rear sets on each side only, but not between the front and rear sets as a whole. Brake leverage is equally proportioned between front and back.

Supplementing a range consisting of a 14 hp. four (99 cu. in.), 20 hp. six (175 cu. in.) and 30 hp. six (302 cu. in.). Armstrong-Siddeley has introduced a 15 hp. six (2½ x 4 in. bore and stroke; 116 cu. in.) differing from the others in having side valves. The engine is designed to fit into the 14 hp. four chassis without reducing the body space, the only alteration called for being the shifting of the radiator a few inches farther forward. The same range of bodywork is used for both chassis, with an extra £40 attached to the new six in each case; thus the coachbuilt sedan on the four (reduced £15) is £360 and on the six £400, a new fabric

half of the crankcase are a unit, the lower half being in cast aluminum with the 10-pint capacity sump. The clutch is a single-plate type. Chassis lubrication is of the one-shot type to most bearings, as on other models for 1928, though the steering joints are lubricated by grease gun.

Although Austin shows no new model—the existing range being the 207 cu. in. six and the 220, 112 and 45 cu. in. fours—a new one has been announced with deliveries commencing March 1. It is on much the same lines as the 207 cu. in. six (termed 20 hp.) and has a side valve engine of 136 cu. in., eight-bearing crankshaft, silent chain distribution at the rear end and battery ignition. The unit powerplant includes a single-plate clutch and four-speed geaset with central control, giving forward ratios of 19.8, 12, 7.9 and 5.1. Half-elliptic springs are used, underslung at the rear, and Hotchkiss drive. The brake pedal operates the wheel drum shoes, while the hand lever applies a heavy transmission brake. The wheelbase is 112 in., track 56 in., overall length 13 ft. 6 in., and with a phaeton body the price is to be £355, or £395 with a six-light coachbuilt sedan.

Bentley is Large Four

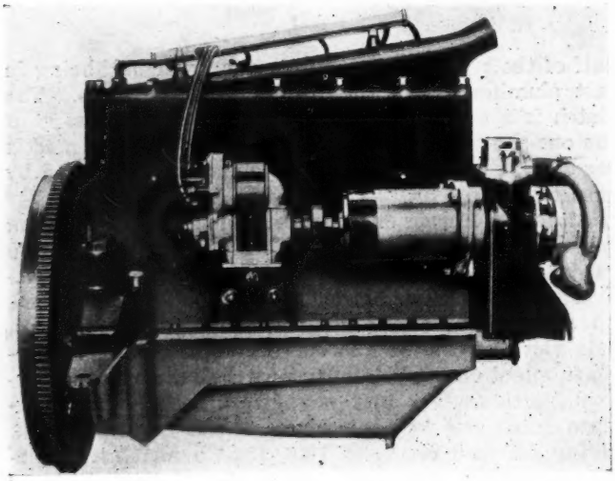
The only new British model with a four-cylinder engine of over 140 cu. in. piston displacement is the 4½-liter Bentley, a high-efficiency type, with overhead camshaft, supplementing the 3-liter four and the 6½-liter six and having similar constructional features. It has

a bore and stroke of 100 x 140 mm. For the overhead camshaft drive, bevel gears and a vertical shaft are used; four speeds are provided with a cone clutch. Hotchkiss drive with spiral bevels of 3.5 ratio, half-elliptic springs, direct mechanical operation for the four-wheel brakes, a 130-in. wheelbase, 53⅝-in. track and wire wheels are other features, the chassis weight being 2800 lb. and the price £1,050.

This make of a popular type of car (competing directly with Morris among others) has been supplemented by two new models, a 9 hp. four of 66 cu. in. and a 12 hp. four of 96 cu. in. Both have side valves, three-speed gearset, spiral bevel drive, four-wheel brakes and quarter-elliptic rear springs, the nine having a single-plate clutch and the twelve a cone.

The nine with a wheelbase of 90 in. and a 46-in. track is designed for small four-passenger bodies, open and closed, the phaeton being £145 and the two-door fabric sedan £160. The twelve has a three-bearing crankshaft, cast-iron pistons, steel connecting rods, pressure lubrication, dual roller chain distribution, a semi-Ricardo head, separate inlet and exhaust manifolds (the carburetor being at the extreme rear end of a manifold "stem" carried horizontally from a right-hand bend to the back of the engine), four-point suspension, 108-in. wheelbase and 48-in. track, and is offered with four styles of body-work, of which the phaeton is £220 and the fabric and coachbuilt saloons £250.

Besides introducing two new sixes, Lea-Francis is offering a 12 hp. four (91 cu. in) with a Cozette supercharger. The standard body of this supercharged model is a low-built four-passenger fabric phaeton. The rear axle, with a track of 49 in., is formed of two aluminum castings with malleable extensions. A point of note in the four-wheel braking equipment is that all the cross shafts are tubular and are filled with oil during assembly, and have small leak holes at their bearings. Fuel



The Armstrong-Siddeley 15 hp. six-cylinder engine, right side. Has cubic capacity of 1.9 liters and is used on same chassis as 14 hp. four

from the 10-gal. tank at the rear is delivered to the Cozette carburetor by an Auto-pulse pump, electrically-driven. The supercharger is located at the front of the engine and is driven by silent chain. Speeds up to 85 m.p.h. are claimed. The price of the car is £495, which is £200 more than the non-supercharged model of the same engine dimensions and a phaeton body. One of the new six-cylinder engines (103 cu. in.) is offered with a supercharger in the same chassis. Both sixes, the second being of 119 cu. in. capacity, have overhead camshafts and four speeds.

Although no entirely new chassis models have been introduced by Singers for 1928, many alterations in chassis and bodywork have been made. Thus the 8 hp. four-cylinder model (52 cu. in.) with overhead camshaft has been given semi-elliptic springs in place of quarter-elliptics at the front to permit the provision of front brakes as standard equipment, notwithstanding a price reduction from £147 to £140 in the case of the open four-passenger. For this model, as for the larger Four and the 108 cu. in. Six a fabric sedan has been standardized (£165), while all models can have a Sunsaloon body.

Standard has added a 70 cu. in. four, termed 9 hp., to supplement a 118 cu. in. four and a 134 cu. in. six. The new engine has side valves (the first post-war Standard without overhead valves) and a semi-Ricardo head. With a bore and stroke of 60 x 102 mm., it has aluminium pistons and duralumin connecting rods, roller chain distribution and hollow crankshaft lubrication from a gear type oil pump, the latter being skew-gear driven directly from the center of the camshaft; the pump casing has an integral relief valve and pressure-side oil filter.

Bodies Are Roomy

Although the wheelbase of this small car is only 92 in. and the track 45 in., the four-passenger bodies afford a surprising amount of room; four adults of 6 feet in height are not overcrowded. Two ways in which that result has been secured are the sinking of foot wells in the rear compartment and carrying the front floor ramp partly over the engine, though this has not affected the accessibility of any part.

One of the pioneer firms of the British motor industry, the Star Co., has introduced a new 2½-liter six to supplement a four of 1.9 liters and a six of 3.2 liters. The new engine, like the continued models, has overhead pushrod operated valves but is distinctive in having a cylinder block with separately inserted cast-iron liners.

Since the previous Olympia Show, the Wolseley interests have been acquired, as may be recalled, by W. R. Morris of Morris Motors Ltd., and one result, beyond the entire reorganization of the plant at Birmingham, is seen in the introduction of a larger four (91 cu. in.) to supplement the 77 cu. in. four, and a 160 cu. in. straight-eight, while the 122 cu. in. six is retained. The range for 1928 is therefore unique among British productions in including fours, a six and an eight.

The Eight, like all the others, has an overhead camshaft, but the latter is in two parts with a helical bevel and vertical shaft drive at the center, the crankshaft also being in sections, flange jointed; in front of the flange is a skew gear for the oil pump drive and in front of that again is the helical bevel gear for the camshaft drive.

Many of the smaller parts—pistons, connecting rods, valves, rockers, etc.—of the eight are interchangeable with those of the continued six, the two engines having the same bore and stroke (65 x 101 mm.)

The crankshaft construction is worthy of note. It really consists of three parts, (1) the front portion with four cranks and an extension with a tapered and threaded end, (2) the rear portion, of which the foremost crank is integral with a circular flange, and (3) a flanged connecting unit comprising a sleeve carrying a helical bevel and a skew gear and bored to suit the tapered extension of the front portion of the crankshaft.

Just Among Ourselves

Are His Elephants of the Pink Variety?

GEORGE WOODRUFF, vice-chairman, National Bank of the the Republic, Chicago, put himself at odds with most other business analysts, including the members of Mr. Coolidge's cabinet, when he voiced the opinion to the Associated Business Papers' convention the other day that we really are now in a period of inflation. He urged recognition of this fact as a means of softening the blow of deflation at a later time. While he doesn't see any immediate danger of economic troubles, he does see potential future difficulties. "The elephants appear to be a long ways down the road," he said, "but they're on the march. Hold your horses!" Despite a certain undertone of pessimism which has been running lately in some quarters of business, it is worth noting that some of the most conservative and best known economic students in the country are firmly optimistic in their tone at this time and feel quite strongly that we are not in any sense experiencing a period of inflation at present. The chief real danger at the moment, some feel, would seem to be the danger of business talking itself into a pessimistic mood for no particular reason. There is every evidence, so far as automotive markets and sales go, that 1928 will provide just as good and possibly better business for many companies than has 1927.

* * *

Financing Rates as a Sales Factor

IT'S going to be interesting to get the figures this year on the progress of sound retail financing terms and also to see how the repossession ratio is moving. Despite some considerable slump in sales during recent weeks, there seem to be no evidences of any swing back toward unsound financing terms. As a matter of fact, more and more men in the industry are coming to the belief that unusual financing rates and terms aren't nearly so much of an actual sales factor as a lot of folks have appeared to think. It is reasonable to believe, certainly, that the difference between a sale lost and a sale made doesn't very often rest in the difference of a few dollars in a financing rate. Theoretically some such result might be expected, but practically it just doesn't work out that way very often; ninety-nine times out of a hundred, we venture to say, the sale is made or lost because of some factor other than that of difference in financing rate or terms.

* * *

Progress Being Made Toward Safe Financing

IT is quite probable that the final figures on 1927 business will reflect progress in the use of sound retail passenger car financing terms. Last year, it will be remembered, figures of the National Association of Finance Companies showed 13.24 per cent of automobile retail paper which called for more than the 12 monthly payments recommended; that figure represented a decline in this so-called irregular paper from 18.32 per cent in 1925. It is our guess that another definite decline in this percentage will be shown to have been recorded in 1927. The trend of general conditions would indicate, moreover, that the figure of 9 per cent representing retail paper in 1926 with down payment of less than 25 per cent on new cars, or 35 per cent or less on used cars, will show a decrease. The other most significant figure, of course, is that concerning repossessions. Last year the percentage of repossession of cars sold on standard terms was 2.09 per cent, a slight increase over the 1.72 per cent of the previous year. There have been some hopes that a reduction in this figure would be made this year, but the amount of long-term paper still approaching maturity during 1927 makes it seem unlikely that this desirable result has been obtained. Certainly there are no signs of any material turn for the worse, however. On the whole, therefore, we see good reason to believe that very real progress toward sound, sane retail financing terms has been made during the last ten months.

* * *

Don't Embrace the Chauffeur!

THE cooperative advancement of purity and safe driving as evidenced in section 42 of the new traffic ordinance of the rising town of South Bend, Indiana: "It shall be unlawful," says section 42, "for any person to embrace any person while operating any vehicle on the streets of South Bend, or for any person to so operate a vehicle while being subjected to the embraces of any other person; and it shall be unlawful for any person to embrace any person so operating any vehicle." If we get the meaning of this clearly it indicates that embracing or being embraced while driving a vehicle is unlawful in South Bend.—N.G.S.

Bosch Incorporates New *Features* in *Type* "Y" Shock Absorber

Action designed to give increasing resistance to rebound as amount of reaction and its rapidity increase. Now in production for all sizes of passenger cars.

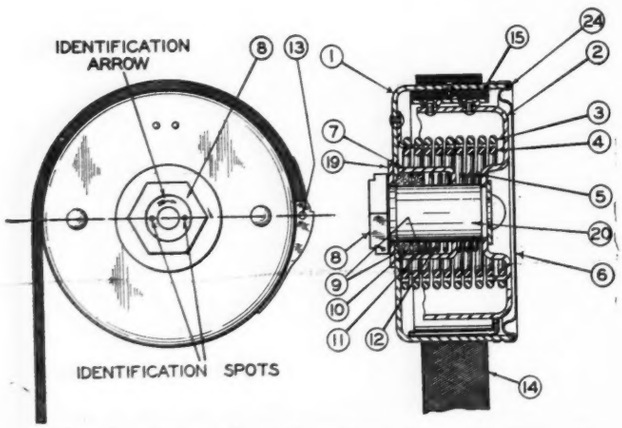
By Edmund B. Neil

THE American Bosch Magneto Co. of Springfield, Mass., has recently developed and is now producing a new friction-type of shock absorber in which several features differentiating them from other Bosch models are incorporated. The new model is known as the Type Y and is designed for use on all sizes of passenger cars.

As will be noted from the accompanying illustrations, the unit consists of an outer shell 1 with a pressed-on cover 6 completely inclosing the working parts. The rebound strap or check band 14 is attached to the outside of the cover, which eliminates the need for an opening through which it can pass into the interior of the shell. The friction material consists of a section of brake lining 15, riveted to the upper half of the inside of this outer shell.

The friction or rubbing element acting against the friction lining is a semi-circular piece of hardened steel, 16, this in turn being attached to an inner shell 2, securely fastened to the central mounting pin 20, around which the moving parts reciprocate. The hardened steel friction piece is riveted to the inner shell only at its center, so that both ends are free to rub or drag against the brake lining on the inner surface of the outer shell to a sufficient extent to stabilize rotation of the outer shell during the "wind-up" or depression stroke.

Within the inner shell are two coiled springs 3 and 4, one end of each spring being attached to the fixed inner shell, and the other end similarly mounted over a pin secured into the outer shell. By using two springs a smoothly balanced pressure is obtained between the two friction elements, with no tendency for one shell to cock or twist relative to the other.



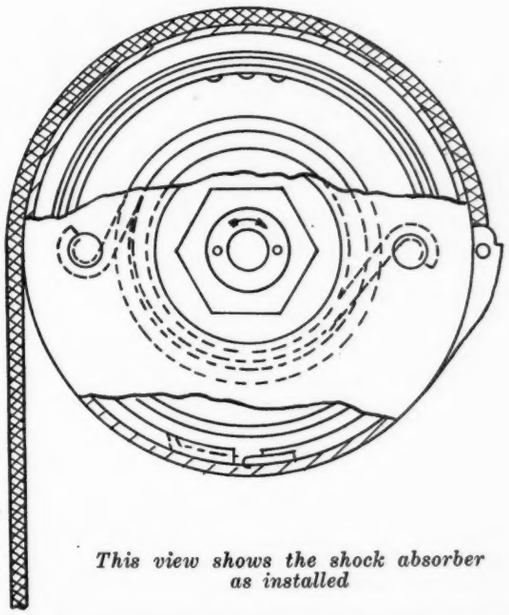
Side elevation and section through Bosch Type Y shock absorber

Aside from the fact that the check or rebound strap is mounted over the outside of the outer shell, in consequence of which there is no opening through which dust and dirt can enter, one of the interesting features is the method used to prevent dirt and moisture from entering between the outer shell and the mounting pin. Two small coiled springs are employed, one, 5, to force the stuffing box cup 7 against the outer shell, and the other, 12, to compress the packing 9 against the chamfered inner edge of the hole in the outer shell. Note that two packing rings are used, between which a flat washer 10 is placed, and that another washer, 11, is placed behind the inner packing ring. A large washer 19 is placed between the outer shell and the hex nut 8, which in turn is arranged as a standard mounting for all types of brackets, so that the same unit can be used for many different applications.

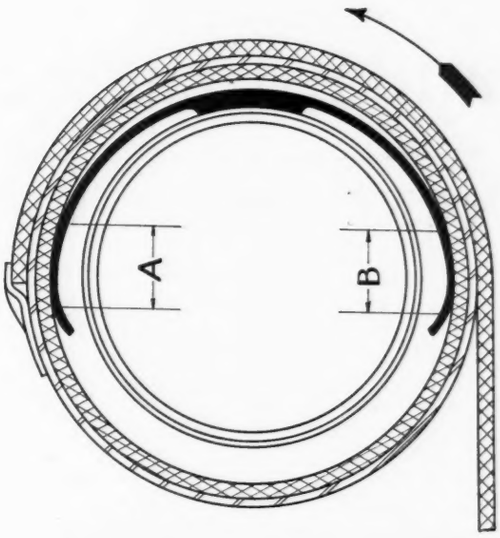
Attaching Inner Shell

The method of attaching the inner shell 2 to the central mounting pin is also of interest. There are two "flats" on the hole in the inner shell and during assembly this part is lightly pressed onto corresponding flats on the pin, a washer is placed over the hole and the two parts are roll-riveted under pressure. As will be noticed from the drawing, the size of the rivet is substantial, so that there is little chance that the shell will ever work loose from the pin even in the most severe service.

When installed, the action of the absorber is designed to give an increasing resistance to rebound as the amount of reaction and its rapidity increase. It will be noted that the outer shell does not touch the mounting pin at the hole in the shell. Hence the outer shell floats over the semi-circular steel sheave, the ends of which are slightly spread outward in normal position. Conditions on a light rebound are therefore similar to those existing during the wind-up stroke of the device, when only points A and B press against the brake lining. As the force applied to the rebound strap increases, the outer shell will be drawn down against the inner shell, thus contracting the ends of the hardened sheave and permitting the entire surface of the sheave to come into contact with the lining, and at the same time increasing the pressure between the two should the "jerk" on the strap be severe. As the number of strokes per minute is increased, the belt or strap tension also becomes greater, the action applying over several inches of belt travel. On the depression or wind-up stroke, the belt tension is comparatively low.



This view shows the shock absorber as installed



Showing relations of parts during the wind-up stroke, frictional contact extending over arcs A and B

Prior to installing the absorber on a car, the initial belt tension is correctly set at the factory and the two shells are locked together by a small pin extending inward against the brake lining. The first time the rebound strap is pulled downward after the device is installed, this pin is released and snaps back against the shell, where it cannot come in contact with the rotating parts.

The unit requires no lubrication other than that supplied when it is originally assembled, and the outer shell cover is so fitted that a special tool is necessary to begin disassembly.

Electric Truck Business Reported Growing

FOUR makers of electric trucks had a cooperative exhibit at the Twentieth Annual Electrical and Industrial Exhibition which opened in the Grand Central Palace, New York, on Wednesday, Oct. 12. The exhibit was under the auspices of the Society for Electrical Development, Inc., and the four companies represented were the Commercial Truck Co. of Philadelphia; O. B. Electric Truck, New York; Walker Vehicle Co., Chicago, and Ward Motor Vehicle Co., Mount Vernon, N. Y.

The Commercial Truck Co. showed a 1-ton closed body type delivery wagon, the O. B. Electric Truck, Inc., a 5-ton chassis (featured by resistance control), the Walker Vehicle Co., a ½-ton chassis and the Ward Vehicle Co. a 1700 lb. closed body delivery wagon. Adjacent to the exhibit of electric vehicles, the General Electric Co. had an exhibit of electric vehicle components, including a vehicle motor, controller, resistance unit, charging receptacle and a combined running and charging switch. On a stand close by were shown a Rauland electric crane industrial (low wheel) truck and a Wright-Hibbard electric lift industrial truck. Both of these lines of electric industrial trucks were shown by the New York representative.

Interviews with the representatives of the electric vehicle firms exhibiting proved them to be in an optimistic frame of mind with respect to the outlook for electric trucks in city service. Electric towing wagons and wrecking cars will be used exclusively in the Holland vehicular tunnel under the Hudson River between New York and Jersey City, which will be opened the latter part of this month. Four vehicles have been purchased for this purpose from the Commercial Truck Co. of Philadelphia, two wreckers and two towing cars. These will be stationed at opposite ends of the tunnel, and in case a vehicle gets stalled in the tunnel, all of the vehicles ahead of it will be allowed to leave the tunnel, whereupon a wrecker or a tower—as may be required—will enter the tunnel and pull out the disabled car.

During the past year electric trucks have been extensively adopted in New York City by coal dealers (Burns Brothers), milk companies, pork products manufacturers and commercial truckmen. The American Railway Express Co., which always has been one of the largest users of electric trucks in the country, ordered 106 new machines during the past year, the writer was informed.

The product of the electric vehicle industry has been gradually improved, the speed having been increased, especially in the smaller sizes. The mileage on one charge also has been increased, in the smaller sizes as much as 50 per cent, the writer was told. This improvement was brought about partly by the use of larger storage batteries.

"Trade-Buying Habits in Pennsylvania"

OWING to space limitations in this issue, the second part of David Beecroft's article on "Trade-Buying Habits in Pennsylvania," which was promised for this week, has been held over until the issue of Nov. 5.—*Editor.*

Standardization of Gear Hobs Next on A.G.M.A. Program

Project is inaugurated at meeting in Montreal. Broadening of association's studies urged by President Frost. Wide range of technical papers presented.

By P. M. Heldt

THE reading of a number of interesting technical papers marked the semi-annual convention of the American Gear Manufacturers Association which was held at Montreal, Canada, Oct. 20-22. Of chief automotive interest was that by George H. Acker, chief engineer of the Cleveland Worm & Gear Co., Cleveland, O., on Worm Gear Inspection and Testing. The author discussed in a general way the problems involved in production inspection of automotive type worm gears and gave illustrated descriptions of fixtures developed by his firm for comparing the diameters of worms and for checking the index and the lead. In the absence of the author this paper was read by H. J. Eberhardt.

A paper of an analytical character on The Effect of Hob Corrections on Gear Teeth was read by James A. Hall, Professor of Mechanical Engineering at Brown University, who had investigated the subject as consulting engineer for the Brown & Sharpe Mfg. Co. In order to prevent rough action of involute gear teeth due to the elasticity of the gear material and the non-rigidity of the mountings, it has become customary to provide a correction at the bottom of the hob teeth which results in a tip correction of the gear teeth. Prof. Hall's paper dealt chiefly with the relation between the forms of the hob correction and the gear correction.

A. A. Ross of the General Electric Co. presented a paper on Marine Gear Drives in which he dealt with the experience of his company in building geared transmissions for ships fitted with steam turbines, during and after the war. It was found that flexibility is one of the chief requirements if the drive is to be durable and to provide this the driving pinions, instead of being connected directly to their sources of power, were made hollow, and a small-diameter and consequently flexible shaft was passed through them, which was connected to the pinion at the far end by means of a pin-coupling.

Waterman in Europe

Not as much was accomplished in the way of technical standardization as at some previous meetings, which was accounted for partly by the absence in Europe of Chairman B. F. Waterman of the Technical Standards Committee and partly by the fact that at the meeting held at Jackson, Mich., last spring most of the sub-committees put through the work they had had in hand and there had been no meeting of these sub-committees since. However, a project was inaugurated at the meeting which bids fair to equal in importance anything yet accomplished by the association in the way of standardization. This is the standardization of gear hobs.

President E. J. Frost's address was essentially an exhortation of the members to put their shoulders to the wheel and help accomplish the objects the association set out to accomplish. After enumerating these objects as set forth in Article 2 of the constitution he continued:

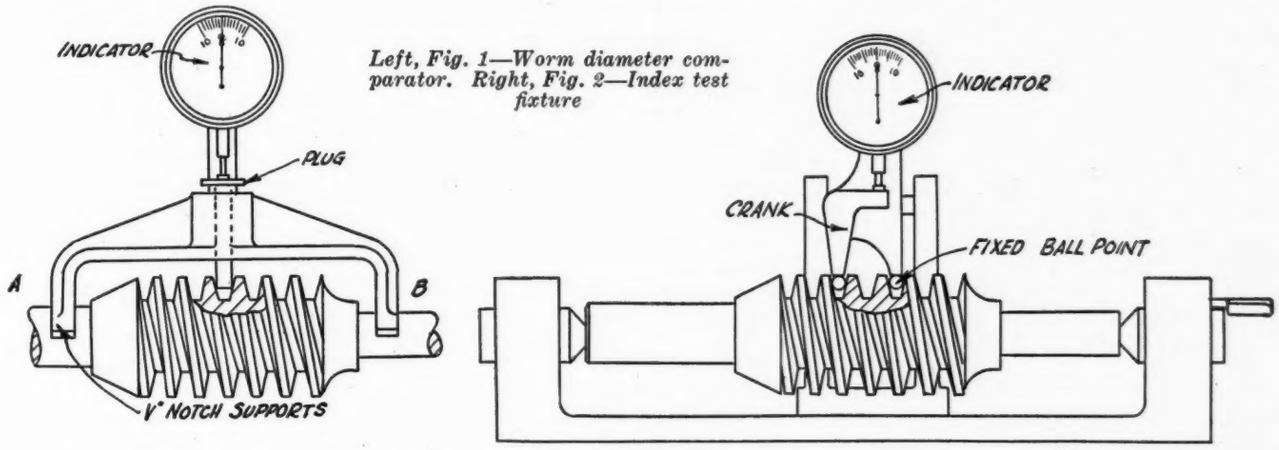
"We certainly have not discussed all of the subjects of interest and value to the industry. Right now, after more than 10 years of association activity, we are beginning to discuss the subject of the standardization of hobs, to do away, as far as possible, with the myriad of designs now on the market and for which you pay, not alone in increased first cost, but in minimized adaptability due to vagaries of tooth form, diameter of bore or size of keyway.

Knowledge of Steels

"Do you think that we as individuals, or even collectively, know all we can or should about the suitability of various steels for different uses? Don't you think that we might even go as far afield in our search for useful knowledge as to let specialists talk to us on such subjects as proper illumination of our shops, the latest advancement in cutting tools such as gear and milling cutters, the proper protection of our plants against fire hazards, the elimination of monetary loss due to industrial accidents, or even have someone check us up to see how much (or how little) we know about fire insurance and what our policies actually cover?

"Wouldn't you feel well repaid for your trip to the meeting if, when you reached home after listening to such a talk as last mentioned, you checked up and found you had been paying premiums for 10, 15 or perhaps 20 years on values on which you could not recover a penny in insurance if you did have a fire?

"We should, through our contacts at the meetings, attempt to bring about more intelligent and uniform methods of cost finding so that quotations from a half dozen of our members, when based on the same specifications, would not make us the despair and at the same time the laughing-stock of the firms quoted. We are the victims of our own folly when we let ignorance or cupidity, or both, lead us into quoting prices that will no more than cover the cost of the raw material, and it is almost equally bad on the faith of our customers when we name prices way beyond any justifica-



Left, Fig. 1—Worm diameter comparator. Right, Fig. 2—Index test fixture

tion in material or in manufacturing cost."

President Frost announced at the opening that at a meeting of the Executive Committee it had been decided to hold the next meeting of the association in Rochester, N. Y., during the latter part of April. The present and the last previous meeting were held at points rather remote from the centers of the industry, which probably accounted for a falling off in attendance as compared with previous meetings, and it was therefore decided to hold the next meeting in a more centrally located city.

Three new member companies were unanimously elected at the meeting, namely, the Fairfield Mfg. Co., Lafayette, Ind., Perkins Machine & Gear Co., Springfield, Mass., and Goodman Mfg. Co., Chicago, Ill.

E. W. Miller, who in the absence of B. F. Waterman reported for the General Standardization Committee, said that at the last meeting at Jackson 11 recommended practices had been presented and all of them had been adopted, some with minor revisions. This had resulted in a dearth of material for presentation at this meeting.

Mr. Miller expressed the belief that much remains to be done in the way of gear standardization. When work of this kind is undertaken the more or less obvious is seized upon first, but as it progresses, less apparent and possibly more difficult subjects suggest themselves and call for attention. The American Gear Manufacturers Association recently has secured membership on the American Engineering Standards Committee, and this, Mr. Miller thought should prove a boon to the standardization efforts of the association.

D. T. Hamilton, who reported for J. L. Williamson, chairman of the Spur Gear Committee, said that since the last meeting its efforts had been confined chiefly to the items that are being investigated by L. F. Burnham. In addition, however, it had put into final form its recommendation with respect to back lash. A diagram has been added and is referred to in the text, which shows that the feeler should be inserted between two teeth and on the line of action. This Recommended Practice will be distributed in the near future.

The work of L. F. Burnham, R. D. Nuttall Co., relates to horsepower charts for spur gears. At the Jackson meeting Mr. Burnham showed a blank chart and explained the proposed method of presenting his calculated capacity data, and at this meeting he presented a good deal of the actual data. The work done this year, the results of which were presented at the meeting, consisted in the calculation of horsepower capacities of gears of ½ in. bore, with from 15 to 30 teeth inclusive, for stresses in the shaft material of 4000, 6000 and 8000 lb. p. sq. in. respectively.

It was decided to appoint a committee to initiate the work of gear hob standardization. In the discussion of this matter it was brought out that at the present time there is absolutely no uniformity of practice in this field. Bores, sizes of keyways, outside diameters and lengths should be standardized, as well as modifications of the teeth from the true involute form. An investigation made last year by the Tooth Form Committee showed that five principal makers of hobs use different modifications to assure tip relief of gears. In four cases the relieved portion of the gear forms an involute of more than the standard pressure angle, this relief being formed by a straight line at the bottom of the hob tooth of more inclination than the major portion of the tooth, while in one case the modification in the hob tooth is in the form of a fillet circle. Discussion showed that the hob makers in general favor standardization of the form of relief, as well as of other tooth elements. Standardization of the relief will be in charge of the Tooth Form Committee.

Research Committee's Work

The work of the research committee on gears was referred to by both Chairman Miller of the committee and by Clifford B. Le Page, assistant secretary of the A.S.M.E. It appears that 10 reports have been issued on the work done on the Lewis gear testing machine at Massachusetts Institute of Technology and that these fully cover the experimental work to date. All of these reports are available to the members. It is admitted by Prof. Buckingham, who is responsible for them, that these are somewhat academic in character, but he feels that it devolves upon the other members of the committee to put the material in such shape that it can be readily made use of by the members.

O. W. White, chairman of the Differential Committee, asked that the committee be dissolved, as there was no further work for it in sight. It had been working along parallel lines with a committee of the S. A. E., and in connection with the work of the latter the objection had been raised that it had carried it further than was desirable—that its most recent work had amounted really to standardization of design, which was not wanted. After Mr. White had been assured that the situation was understood by the membership and that no blame rested on him for not having a report, he was induced to retain the chairmanship of the committee, which it was thought desirable to keep standing.

H. J. Eberhardt, in presenting the report of the Tooth Form Committee, said the analysis of the effects of hob modification with the object of producing tip relief made in Prof. Hall's paper, had solved many problems that

would have to be tackled by whoever would be charged with the duty of standardizing gear hobs. The A. G. M. A. had received many requests for the standardization of gear hobs. The chief problems to be solved are the minimum number of teeth in the gear for which tip relief is required and the amount of tip relief required.

Mr. Eberhardt said that customers ordering cutters for A. G. M. A. standard gears often do not use the proper terms to designate these gears, and to remedy this state of affairs he suggested that the association issue a booklet giving the specifications of the four standard types of gearing, viz.: the 14½ deg. and 20 deg. full depth involute, the composite system and the stub tooth involute systems for spur gears.

It was decided to ask the A. S. M. E. to extend its standard for cold rolled shafting beyond a diameter of 6 in. and at least up to 12 in., and also to consider the inclusion of a 5/16-in. key in its standard of keystock sizes. A request for an extension of its standard for cold rolled shafting had been made to the A.S.M.E. also by the American Petroleum Institute. It is particularly desired by the A.G. M. A. that the 5/16-in. key be included in the A. S. M. E. standard, because that would make the A. G. M. A. and A. S. M. E. standards covering this subject identical.

The report of the Nomenclature Committee, presented by D. T. Hamilton, showed that the proposed system of nomenclature, including terms, symbols, definitions, formulas and illustrations, has been completed so far as spur and helical gears are concerned, and this part of the program has been accepted and is ready for the printer. Much work has been done by F. E. McMullen on a system of nomenclature for bevel and spiral bevel gears, based on the same plan as that for spur and helical gears and containing 87 items.

Industrial Standards

Mr. LePage made some observations on the making of American standards. He said that industrial standards are of three kinds—company standards, association standards, and national standards—and the aim of his paper was to show that the establishment of national or American standards by the present A. E. S. C. method is a logical development in American industry. The A. G. M. A., which had recently joined the A. E. S. C., might possibly benefit from the technique developed by the A. S. M. E. during its nine years of experience with the A. E. S. C. method.

Mr. LePage argued that the passing from company to association standards and from the latter to national standards was a logical evolution. His second argument in favor of such standards was that the consumer has a voice in the establishment of such standards. There is a growing sentiment among purchasers favorable to the use of purchase specifications of some kind. In buying and selling there are two interested parties, and standard specifications are of advantage to both. The user's interest in such standards centers around (a) interchangeability of component parts, (b) prompt filing of orders from the stocks of the manufacturer, (c) ready replacement of damaged and worn parts, (d) avoidance of misunderstanding by a uniform nomenclature, and (e) not infrequently the reduction of the selling price. In a word, he has interests which are similar in some respects to those of the manufacturer, but which are enough different to justify his having a place in the standardization program.

The third argument in favor of the proposition is that there is inspiration, enthusiasm and economy in group action. The A. E. S. C. procedure calls for the organization of sectional committees which are broadly representative of the social and economic interests of the producer, consumer and general public.

Worm Gear Inspection and Testing

George H. Acker's paper on Worm Gear Inspection and Testing follows in slightly abbreviated form:

The general trend of the past few years toward higher operating speeds and more compact mechanisms has given rise to continual development in the manufacture of worm gearing, said Mr. Acker in his paper. Harder, stronger gear materials have been developed to meet the demand for compactness, and this change, with the increasing operating speeds, require far greater accuracy of manufacture than had been customary. To meet these new conditions, new testing methods are continually required that will guarantee the necessary accuracy at minimum cost.

The requirements in accuracy of workmanship vary with the nature of the task to which the gears are to be applied, and the probable errors to be guarded against depend upon the production methods employed. Generally, the methods of testing each job may be to some slight extent unique. The present discussion is limited to the automotive type gearing produced on a quantity basis.

The following are some of the potential sources of error in worm gearing that must be guarded against by suitable inspection:

A. Eccentricity of worm
B. Correct sizing of worm
C. Index of worm thread
D. Head of worm thread
E. Profile of worm thread
F. Angle of gear
G. Eccentricity of gear
H. Silence.

With the exception of very large worms, and some others of unusual design, it is customary to thread-grind the worm on centers. To avoid the possibility of eccentricity between worm threads and bearing seats, particularly on work having cotter pin holes intersecting the center holes, a bridge-type gage as shown in Fig. 1 is employed. This gage is made with V notches at the supporting ends *A* and *B* that rest on the ground worm journals, and automatically line the instrument up with the work. The plunger *C* is made with a slight bevel on its lower end, and the diameter and angle of bevel are made to conform fairly well to the thread space of the worm somewhere near the pitch diameter. The instrument is held against the work, so that the plunger drops into one the thread spaces, coming to rest with the bevel resting on each thread flank. The indicator plunger follows this beveled plunger, and indicates the depth to which the beveled plunger settles. By rotating the work and getting a depth reading on each thread space, the amount of eccentricity of the worm thread with regard to the journals is ascertained.

This same instrument is employed to gage the size of the worm, by obtaining a zero setting for the indicator on a master worm, and checking the production worm against that setting. This instrument has one objectionable feature, in that it includes errors in journal diameter in its reading, when used as a comparative tool from one worm to another. By providing a device similar in principle but made so that the worm to be tested can be mounted on centers, this objection is overcome.

In this type of instrument it is desirable to use a plug having a slight bevel, rather than a close-fitting plug, to avoid the errors in measurement that would

result in such case from variation in profile.

On multiple threaded worms it is necessary to insure a high degree of accuracy in the spacing or indexing of the worm threads. This can be tested out on a milling machine equipped with a dividing head, but not with sufficient accuracy or speed for production work. Fig. 2 illustrates a simple fixture for index testing that has proven very satisfactory. This fixture provides a bed, as well as centers on which the worm can be mounted, and a trunnioned arm that can be dropped down on the worm. This arm carries two ball points that engage in different thread spaces on the worm. One ball point is rigidly secured to the trunnioned arm, the other is mounted on a bell crank in such a manner that movement of the ball point in the direction of the worm axis is recorded on an indicator. With the trunnioned arm lowered so that the ball points rest in their respective thread spaces the indicator is set to zero. The trunnioned arm is then raised and the worm indexed enough to allow the ball points to enter another pair of thread spaces, and so on. Variation in thread spacing will cause a proportional movement of the ball point mounted on the bell crank, and will therefore show up in the indicator reading.

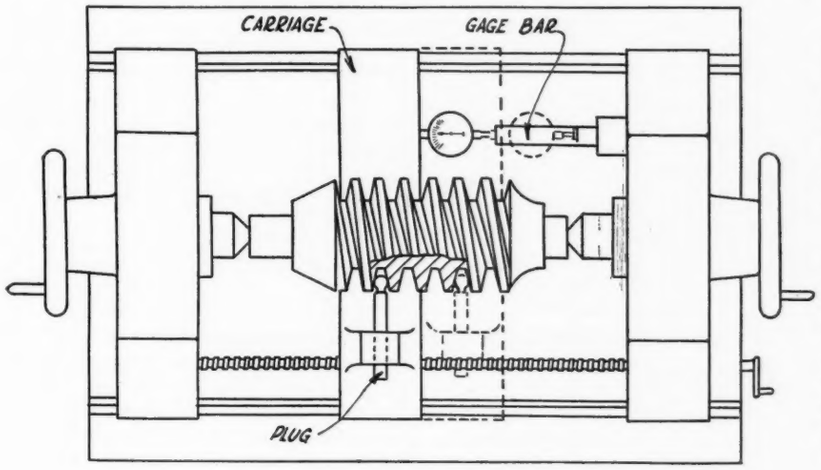


Fig. 3—Lead test fixture

A number of methods are available for testing the lead of the worm thread. A rough check can be made by the ordinary milling machine when arranged for helical milling, but the results are never certain, due to the probability of backlash and uneven wear on the machine.

The most accurate method of checking lead is to employ a machine similar to that illustrated diagrammatically in Fig. 3. It resembles a lathe bed equipped with two tail stocks that support the worm on centers. In place of the usual lathe tool post a column is provided having a close-limit bore through it, so located that the axis of the bore intersects, and is at right angles to the axis of the worm, when the latter is held on the centers. A plug having a sliding fit in the bore, and a beveled end or a ball point that engages the worm thread space at about the pitch line is required.

The carriage is set so that this plug can be entered in one of the worm thread spaces, somewhere near one end of the worm body, and then the worm is locked on the centers so it cannot be rotated. A suitable hardened anvil is provided on one of the tail stocks, and an indicator is mounted in line with it on the carriage. A bar gage, or a column of gage blocks, is placed between the anvil on the tail stock and the indicator plunger and the indicator is set to zero. The plug is then withdrawn and the carriage brought up to the other end of the worm body, where the plug is re-entered and the carriage adjusted until the plug touches both thread flanks. A new bar reading between the tail stock anvil and the indicator is taken, and from the difference of the two readings the actual worm lead may be calculated.

The greatest objection to this method of lead measurement is that, unless the two plug settings can be extended over a full convolution of worm thread space, the lead as calculated will include any index error present, but by providing the index prior to the lead test, this uncertainty can be removed.

The only inspection test requiring skill and judgment on the part of the operator is the profile test. The most satisfactory method that I have found for comparing worm thread profiles is to use a device similar to that shown in Fig. 3, but with a different type of plug. For profile testing a cylindrical plug having at the start a conical point, can be formed to fit accurately the profile of the thread space of the master worm on the normal section. On a correctly made master worm a plug can be formed that will fit the thread profile over the whole working depth with considerable exactness, so that if the plug be lightly coated with Prussian blue, and rotated in place, it will leave an even marking over the entire working depth of the worm thread.

By using such a plug on production worms and a lamp or reflector below the work, the light beam passing the plug on a poor thread profile affords a satisfactory basis for rejection. A skilled operator is required for this work, however, as we have as yet no quantitative measure in our light beam, and experience must dictate the difference between allowable and objectionable error. This information can be rapidly acquired at the running test stands where worms and gears can be set up and operated under their actual working conditions.

The contour projection method of thread form checking that is now applied to screw threads may one day be used for worm thread form comparison, but the size of the work handled and the large helix angles employed are severe handicaps to overcome in working out such a method on a commercial scale.

Worm gears require very little testing. Tooth form, etc., is insured by carefully checking the hob in much the same manner as the worm is checked. It then only remains to avoid eccentricity and crossed bearing, either of which is easily detected by turning the gearing by hand on a simple center test fixture.

The foregoing discussion has been devoted entirely to control tests on workmanship. It is equally necessary to rigidly inspect the materials that enter into the worms and gears. To this end the generally known testing methods for metallic materials are employed. In the operation of worm gears, however, the lubricant plays an important part.

The functions of a worm gear lubricant are to reduce the sliding friction of the worm on the gear, to prevent metallic contact, and to carry away heat from the contact surfaces at a sufficient rate to prevent local overheating.

AUTOMOTIVE NEWS SECTION INDUSTRIES

Philadelphia, Pennsylvania

Saturday, October 29, 1927

Slow Retail Sales Bring Production Scales Lower

PHILADELPHIA, Oct. 29—Declining production schedules are the rule at the motor car factories. Due to the slackness of the retail market and the rather generous stocks in hands of distributors and dealers in some lines, some manufacturers are winding up their 1927 programs earlier than usual and seizing the opportunity for inventory and plant changes. A few lines are in exceptionally good condition, however, and show little recession from the previous levels.

Although total output by the industry is somewhat below the seasonal level the year has been a good one for a majority of manufacturers. In previous years of decline this has not been the case; nearly all participated in the losses. Having got through such a period without serious consequences, the majority are inclined to look forward to 1928 with unusual confidence.

Years of presidential campaigns have never affected the industry adversely; the reverse has usually been true. By the end of this year stocks in the field will be in good condition and with the arrival of the new Ford, it is believed, buying hesitancy will be overcome and all will share in better business.

Used car stocks, as is customary at this time, are fairly large and a scaling down, if it can be brought about, will undoubtedly better the market for new cars.

Wilmer Says Dodge to Offer Full Line

NEW YORK, Oct. 25—E. G. Wilmer, president of Dodge Brothers, Inc., returning last week from Europe, said that his company had been undergoing extensive transition which had been effected without shutting down the factory. He added:

"We have been getting our dealers in position to offer their customers a complete line of fours and sixes in passenger cars and trucks. We soon will be ready for full speed ahead in production of a wide range of cars and trucks designed to meet the highest modern standard of the automotive industry. We fully expect that 1928 will be the biggest year in our industry."

Packard Earns $11,743,498

DETROIT, Oct. 26—Net earnings of the Packard Motor Car Co. for the fiscal year ended Aug. 31, totaled $11,743,498, comparing with $15,843,586 for the previous fiscal year. Despite an expenditure of $16,523,186 for plant extensions and cash dividends, the company has cash in banks and government, state and municipal bonds amounting to $17,285,719.

A. M. A. Combines With M. & A. M. A.

NEW YORK, Oct. 27—The Motor & Accessory Manufacturers Association and the Automotive Manufacturers Association have been consolidated. Simultaneous statements announcing the consolidation were issued today by H. L. Horning, of Waukesha Motor Co., president of the M. & A. M. A., and John W. Anderson, of the Anderson Co., president of the A. M. A. The enlarged organization will bear the M. & A. M. A. name and headquarters will be continued at the office of that association, with M. L. Heminway as general manager.

Offices of the A. M. A. in Chicago, with W. E. Green as secretary, will be continued as a branch of the M. & A. M. A. credit department with Mr. Green in charge.

The consolidation was approved unanimously by the boards of directors of the two associations as logical because of the common interests of the two memberships. Service to members of the merged organizations will continue without interruption.

The consolidated association will be the largest organization of manufacturers in the automotive industry.

Shaw Joins Pierce-Arrow

BUFFALO, Oct. 27—Lynn M. Shaw has been appointed director of dealer development work of Pierce-Arrow Motor Car Co. During the past seven years Mr. Shaw has been assistant general manager of the National Automobile Dealers Association.

G.M.D. Now Broadcasting

CHICAGO, Oct. 25—Greater Market Development of the Automotive Equipment Association will broadcast information about automotive after-market products through station WGES, Chicago, every Wednesday evening at 6.20 p.m., Standard Time.

W. A. Ryan Resigns as Ford Sales Head

DETROIT, Oct. 27—The resignation of William A. Ryan as general sales manager of Ford Motor Co. became known today. The company declined to confirm the resignation and it would make no statement as to his successor.

Mr. Ryan has been a member of the Ford sales organization since its early days, growing to be first assistant sales manager under Norval A. Hawkins, and becoming sales manager on the retirement of Mr. Hawkins in 1919.

Coupled with the retirement of Mr. Ryan is a report that there has been a sweeping change in Ford department executives.

Velie 8-Cylinder Sedans Are Offered at $2,095

MOLINE, Oct. 26—Series 88, consisting of two eight-cylinder, worm gear sedans listing at $2,095, has been announced by the Velie Motors Corp. The wheelbase is 125 in. and overall height of the two closed models is 67 in.

Specifications include: Lycoming 3¼ x 4½ in. eight-in-line engine; compression ratio, 5.0; aluminum alloy pistons and aluminum connecting rods; Mechanics transmission; Borg & Beck clutch; Cleveland Axle Co. worm gear; rubber bushing type spring shackles; four-wheel Lockheed brakes; Delco-Remy electrical system with Presto-Lite battery; Ross steering gear; Velie built composite type bodies.

Factory equipment includes snubbers front and rear, Ilco-Ryan headlights, bumpers front and rear, Electro ignition lock and radiator emblem.

S. A. E. Holds Transport Meeting

CHICAGO, Oct. 26—Over 200 transportation men gathered here this week for the annual transportation meeting of the Society of Automotive Engineers. Among the major subjects considered were maintenance, freight handling, application of cost figures to operation and maintenance control of rail car and motor coaches. One entire session was given over to the operation and maintenance committee of the society, which, for the first time, took a formal part in the transportation meeting program.

G.M. 9 Months Net Exceeds 1926 Total

Earnings to September Reach Record of $193,758,302—Cash Totals $186,694,068

NEW YORK, Oct. 26—Net earnings of General Motors Corp. for the first nine months of 1927 totaled $193,758,302, which is more than the corporation earned for all of 1926, the previous record year. Prior to June 30, 1926, earnings of that year did not include a 40 per cent interest in Fisher Body Corp. With this the 1926 earnings totaled $194,645,462, or only slightly more than the earnings for the first nine months of this year.

After deducting dividends on the preferred and debenture stock of $6,758,548 the earnings to Sept. 30, 1927, were equivalent to $10.75 per share on the new $25 par value common stock, comparing with $157,731,833 or $8.89 per share for the same period of 1926, this figure including the minority interest in Fisher Body and making allowance for the increased number of shares.

Net earnings of the corporation for the third quarter of 1927 were $64,508,094, including equities in the undivided profits and subsidiary operations not consolidated, comparing with $56,031,879 for the corresponding period of 1926, which was the previous record third quarter.

The corporation held cash, United States Government and other marketable securities totaling $186,694,068 on Sept. 30, 1927, against $135,398,386 at the end of 1926.

Yellow Truck Shows Loss

NEW YORK, Oct. 27—Commenting on the financial statement of the Yellow Truck & Coach Mfg. Co. for the nine months ended Sept. 30, 1927, Paul W. Seiler, president, said:

"Net sales of Yellow Truck & Coach Mfg. Co. for the nine months ended Sept. 30, 1927, were $27,543,170. Net loss before provision for depreciation and income taxes was $555,996. After provision for depreciation and foreign income taxes net loss was $1,147,367.

"A net loss of $423,714, after provision for depreciation and foreign income taxes was realized in the quarter ended of Sept. 30, which compares with a net loss of $55,463 in the second quarter and a net loss of $668,190 in the first quarter. Sales of $10,111,689 in the third quarter, compared with $9,722,822 in the second quarter and with $7,708,658 in the first quarter."

Motor Wheel Net $330,949

LANSING, Oct. 25—Motor Wheel Corp. and subsidiaries report for quarter ended Sept. 30, 1927, net income of $330,949 after interest, depreciation and Federal taxes, equivalent after allowing for 8 per cent preferred dividend requirements to 53 cents a share earned on 550,000 shares of common stock. This compares with $531,544, or 93 cents a share, in the preceding quarter and $515,100, or 90 cents a share, in third quarter of 1926. Net income for first nine months of 1927 totaled $1,377,226 after above charges, equal to $2.40 a share on common stock, against $1,511,127, or $2.64 a share, in first nine months of preceding yeear.

Studebaker Profit Gains in Quarter

NEW YORK, Oct. 25—Net profit of the Studebaker Corp. and subsidiaries for the quarter ended Sept. 30 totaled $3,155,210, after all charges including increased depreciation reserves and reserves for income taxes. This sum, after allowing for dividends on the preferred stock is equivalent to $1.61 per share on the outstanding common stock, comparing with $3,068,264, or $1.56 per share, in the same quarter last year.

Net profits for nine months were $11,627,593, equivalent after preferred dividends to $5.99 per share on the common against $11,804,125, or $6.08 a share for the same period of 1926.

President A. R. Erskine points out that price reductions last July involved about $500,000 in rebates upon dealers' stocks and a corresponding decrease in profits. Number of cars sold in the third quarter this year was 32,298 against 31,228 in the third quarter last year. For nine months production was 94,118 against 90,628 in the comparable period a year ago.

Balance sheet reveals a gain of nearly $6,000,000 in the current assets, which as of Sept. 30 totaled $53,406,941, including $17,032,348 cash, against current assets of $47,548,293 on Dec. 31, 1926. Total current liabilities were $12,355,559 on Sept. 30 against $10,285,855 at the end of 1926.

Lovejoy Shock Absorber for Small Cars Announced

DETROIT, Oct. 25—Announcement of a Delco-Remy-Lovejoy shock absorber for cars in the low priced field, priced at $25 a set of four, is made by Ralph S. Lane, president and general manager of United Motors Service. The new model employs the same hydraulic principle as the larger Model J Lovejoy and is now in production. There is a small additional charge for installation. Distribution will be through channels now handling the Model J.

James E. Kepperley

NEW YORK, Oct. 26—James E. Kepperley, a director and general counsel of the Willys-Overland Co., died Oct. 23 at his home in Summit, N. J. He was born in Renovo, Pa., 52 years ago. Mr. Kepperley was formerly vice-president of the Willys-Overland company and general counsel of the Curtiss Aeroplane & Motor Co., Inc. He also had been with Fisk Rubber Co.

Business in Brief

Written exclusively for* AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co.

NEW YORK, Oct. 27—The most prominent feature of the past week has been the recession in stock prices. Although broker's borrowings have reached a new peak, call money rates are lower. General trade conditions have failed to show an improvement. Wholesale trade has, however, been relatively more favorable than sales at retail. Merchandise exports and the surplus of exports over imports in September were larger than in any other month so far this year.

FREIGHT CAR LOADINGS

Railroad freight car loadings in the week ended Oct. 8, numbered 1,100,552, as compared with 1,126,390 in the previous week and 1,174,928 in the corresponding period a year ago. Total loadings so far this year amount to 41,098,446 cars, as against 41,489,117 cars in the like period last year and 40,112,263 cars two years ago.

PETROLEUM OUTPUT

Production of crude petroleum declined during the week ended Oct. 15, average daily output for that period being 2,494,350 bbl., which compares with 2,526,800 bbl. a week earlier, and 2,234,150 bbl. in the corresponding period a year ago.

IMPORTS AND EXPORTS

September imports and exports totaled $341,000,000 and $426,000,000, respectively. The excess of exports of $85,000,000 is the largest so far this year. Total imports and exports to date amount to $3,152,539,000 and $3,509,407,000, respectively.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices was unchanged last week at 146.2, as compared with 144.7 four weeks earlier.

BANK DEBITS

Bank debits to individual accounts, as reported to the Federal Reserve Board for the week ended Oct. 19, were 27.9 per cent larger than in the preceding week and 11.3 per cent above the amount reported in the corresponding period of 1926.

FEDERAL RESERVE REPORT

For the same period the Federal Reserve banks reported that reserves rose $8,100,000, open market purchases $8,100,000 and deposits $24,100,000. Discounts declined $12,700,000, U. S. Government securities $9,700,000 and note circulation $17,000,000. Member banks for this period reported that loans and discounts increased $16,731,000, investments $16,270,000 and net demand deposits $40,249,000, while borrowings from the Federal Reserve banks declined $15,516,000.

Time money and commercial paper rates were fractionally lower at 3¾ to 4⅜ per cent and 3¾ to 4¼ per cent respectively.

Pennsylvania Uses Last of War Trucks

Highway Department Places First Order for New Equipment in 10 Years

HARRISBURG, PA., Oct. 22—Contracts for $600,000 worth of equipment were awarded by the State Department of Highways this week, the first purchase of new truck equipment in 10 years. Trucks used during this time were obtained mainly from the War Department. With the new equipment it is expected to save $250,000 in repair parts in the next four years.

Awards were as follows:

One hundred three-ton rear-wheel drive trucks, dump bodies: Autocar Co., ten at $4,050 each; White Truck Co., 20 at $4,275 each; Mack Truck Co., 20 at $3,850 each; General Motors Truck Corp., 50, four of these to be delivered to Franklin at $4,270.80 each; 12 delivered at Danville, at $4,273 each; 25 delivered to Greensburg at $4,260.80 each; four delivered to Witmer at $4,269.80 each, and five delivered to Harrisburg at $4,267.80 each. The prices of the other three companies are based on delivery at any of these points.

Thirty-six four-wheel drive three-ton dump trucks were awarded to Loder & Sharp, Inc., Philadelphia, at $5,500 each. Two trucks each of this type were purchased from the Coleman Motor Co., Littleton, Col., at a unit price of $4,803.20 and the Hegins Auto Co., Inc., Hegins, Pa., at a unit price of $5,480, for experimental purposes.

Of 19 tractors, Loder & Sharp, Inc., Philadelphia, four, of 10 tons capacity, at $5,100 each; Beckwith Machinery Co., Philadelphia, 15 at $5,731.35 each.

The George W. Zeigler Machinery Co., Pittsburgh, received the contract for 13 snow plows at a unit price of $3,100.

Ajax Expands at Racine, Takes Over Perfex Plant

RACINE, Oct. 22—Expansion of the main works of the Ajax Rubber Co. at Racine, Wis., is being pushed and completion of a new five-story factory addition is expected shortly after Nov. 1, when the installation of equipment will be undertaken. First additions to the working force will be made immediately after the holidays. The extensions will require approximately 500 additional men, not including the enlarged clerical force, due to the removal of the general offices from New York City to Racine, which is now being completed. The Ajax company also has recently acquired the former plant of the Perfex Radiator Co., adjoining its works. At present the building is being used to house the enlarged office force, but with the completion of the additions, it will be converted by the company into an experimental department and garage.

Interpreters to Aid Overseas Buyers

DETROIT, Oct. 24—The National Standard Parts Association will have two interpreters at the association's annual show in the Cleveland Auditorium, Nov. 14-18 to aid foreign visitors. Ernest W. Lenz and Harry Golden, both accomplished linguists and capable of conversing in any of the language likely to be encountered will render this service. Six hundred overseas distributors have been invited. in addition to parts jobbers throughout the country, and acceptances indicate that the association will have the honor of entertaining among its visitors numerous persons of outstanding importance in the industry overseas.

Canada Pays Back $1,500,000 to Dealers

OTTAWA, Oct. 24—Announcement has been made that the Canadian Government has refunded approximately $1,500,000 of the total of $1,690,000 which had been owing to automobile dealers of Canada, including interest, as reimbursement for the luxury tax which had been paid by the trade on unsold new cars in dealers' hands when the tax was abolished some five years ago.

The government at first declined to repay the tax but the dealers organized to fight the matter and eventually won out, after a fund had been raised and after J. R. Dixon of Ottawa, a former dealer, had been appointed to compile statistics throughout the Dominion regarding individual amounts paid by car agents in tax on unsold automobiles on hand.

M. & A.M.A. Allots Space

NEW YORK, Oct. 24—Records were broken in the allotment of spaces in the National Automobile Shows by the the Motor & Accessory Manufacturers Association. Member companies included in the assignments totaled 110, of which 77 were making parts and accessories and 33 producing service equipment. The service equipment sections, which were innovations for the 1927 shows, have been oversold for 1928.

Auburn Builds Service Unit

AUBURN, IND., Oct. 24—A new service station, costing approximately $50,000 and containing 50,000 sq. ft. of floor space is in the course of construction by Auburn Automobile Co. The building will contain the offices of the service department, a parts department and the service department.

Lack of Alignment Helps Crowd Streets

Erskine Foundation Director Also Finds Left Passing Regulation Harmful

BOSTON, Oct. 24 — Overcrowded streets in most American cities are not used to more than 75 per cent of their capacity. Two of the factors responsible for this are disorderly alignment of traffic and the regulation requiring drivers to pass on the left when overtaking vehicles, according to studies by the Albert Russell Erskine Bureau for Street Traffic Research.

"If all vehicles moved on fixed tracks it would be possible to accommodate a much larger number on a given width roadway," declares Miller McClintock, director of the bureau, which is endowed in Harvard University by the Studebaker Corp. of America. "Part of the present confusion and danger on the streets results from the wavering course of vehicles. This in turn results in wasteful spacing and in collisions. This condition is especially acute on curves and at street intersections. On curves traffic has a tendency to follow the shortest course, while at intersections drivers often draw up in irregular lines when waiting for a traffic signal, and make it impossible for the maximum number of vehicles to approach the intersection or move through it in orderly alignment."

Part of the tendency to cut across curves has been eliminated by the widespread use of lines marking the center of the roadway. This principle can be further extended, however. In reports prepared by the Erskine Bureau on intensive street traffic surveys made in Chicago, and more recently in San Francisco, it is recommended that the entire width of the roadway be divided into lanes on curves and at intersections. In the latter instance the lanes should be marked within 100 ft. of the intersection. Lanes should not be less than nine feet wide, and may be as much wider as required to obtain an equal division of the roadway.

G.M. Exports Up 50%

NEW YORK, Oct. 24—Returning to the United States this week, J. D. Mooney, president of General Motors Export Co., said the company now has 25 plants in Europe and is employing 18,000 persons. Export sales in 1927 will show an increase of 50 per cent over 1926, he said. The American car is dominating the market in Germany, and is an important factor throughout Europe, he declared.

Allbestos Gets Medal

PHILADELPHIA, Oct. 24—Allbestos Corp. has received notice of the award of a gold medal for its products at the Budapest, Hungary, exhibition.

Steel Mills Expect Buying in December

Early Inventories in Automotive Plants Seen Encouraging —Price Situation Weak

NEW YORK, Oct. 27—While the immediate outlook in the steel market is none too encouraging, the market's tone being decidedly soft with prices for most descriptions of finished steel ragged, producers find some comfort in a long range view. Pushing ahead of the inventory period by some of the leading motor car manufacturers is regarded in the steel market as more of a favorable than an unfavorable factor, though it may still more curtail the present low rate of buying.

If inventories can be gotten out of the way by the end of November, it is figured the road should be clear for at least the beginning of a buying movement in December, whereas ordinarily, when inventories are taken in December, all but the most necessary buying is shelved until they have been completed.

One of the leading interest's subsidiaries has issued a new card of differentials on cold-rolled strip steel, reverting to the method of the independents which it had also followed up to early in October. The cold-rolled strip market is now virtually on a basis of 3 cents for lots of 6000 lb. or more of one size and one temper shipped at one time. Reconsideration of the recently introduced special classification of cold-finished strip steel, 12 in. and wider, as stripsheets is being talked of. The sheet market is weak, but the 4.15 cents quotation for full-finished automobile sheets seems to be fairly well maintained. Non-integrated sheet rollers are buying their sheet bars as they need them, refraining from committing themselves on contract as much as possible. In some cases, it is thought, concessions from the nominal market price of $34, Pittsburgh, are obtained. Automotive alloy steels continue to be one of the steadiest items in the list.

Pig Iron—What little buying there is, consists of small lots which command $17.50, Valley, or in Michigan $18, furnace. With cast scrap selling at extremely low prices in some instances, many foundries are naturally using considerable secondary material in their melt.

Aluminum—On the heels of a reduction by the sole domestic producer of all ingot prices to the extent of 1 cent per lb. came announcement of a 1½ @ 2½ cent per lb. cut in prices for aluminum sheets and coils. There are vague rumors that Ford Motor Co. has put out inquiries for prices on secondary metal which must answer specifications more exacting than most dealers care to assume responsibility for. Whether the domestic producer has in mind that such a reduction as announced might make for a broader outlet in the low-priced passenger car field, remains an open question.

Copper—Producers' prices remain nominally unchanged.

Tin—Bull interests in London lend support to the market whenever it wavers under lack of consuming demand.

Lead—Demand from storage battery makers is light. Furthermore weakness abroad tends to depress the market here.

Zinc—Quiet and easy.

Rubber Control Seen Under Investigation

NEW YORK, Oct. 24—Announcement last week by the British Colonial Office that no change will be made Nov. 1 in the present regulations under the Stevenson Act governing the export of rubber from Malaya and Ceylon failed to produce any definite trend in the rubber market. The indication that the British government is making a very thorough investigation of the whole question of rubber export control opens the way to all sorts of speculation and uncertainty as to future policies and serves to prolong the feeling of uncertainty as to market conditions, according to Henderson, Helm & Co.

The Malaya States Information Agency in London received an official cable from Singapore stating that the September shipments of rubber from the restricted areas of Malaya upon which the minimum of duty was paid amounted to 17,390 tons, as compared with 23,011 tons shipped during August.

The official estimate of the carry-over of unused export credits into October is given as 23,425 tons. As this figure includes the October quota of about 17,000 tons, it is shown that there will be unused credits representing about 6500 tons at the end of the restriction quarter.

E. H. Wilson Liquidation Ordered by Federal Court

SPRINGFIELD, ILL., Oct. 22—Attorneys representing various interests in the bankruptcy proceedings against the E. H. Wilson Mfg. Co. this week reached agreement to liquidate the company's holdings as soon as possible and an order has been entered in Federal court directing L. L. Harr, receiver, to proceed with the sale. It is expected that the plant will be sold about Nov. 15 but until the end of this month, the body manufacturing department which is still in operation with a force of 175, will continue work. The company's holdings are valued at $1,000,000 and its stock was widely distributed in this community. Recent recapitalization and overextension of activities precipitated the bankruptcy.

Kearney & Trecker Builds

MILWAUKEE, Oct. 26—Kearney & Trecker Corp, has let a contract for a 75 x 176 ft. addition to its plant which will give it 13,400 ft. of additional manufacturing space. The company has been operating at practically full capacity for over a year and has used a small night force for the past several months to meet orders.

Seligman to Review Instalment Results

Will Cite Economic Effects at Testimonial Dinner Given By Raskob

NEW YORK, Oct. 24—Professor E. R. A. Seligman, Columbia University, will review the results of 15 months' investigation into instalment selling at a dinner given in his honor by John J. Raskob, chairman of the finance committee of General Motors Corp., Nov. 17, at the Ritz-Carlton Hotel.

Professor Seligman's study of the economic effects and conditions surrounding instalment selling, included an analysis of the experience of General Motors Acceptance Corp. The entire investigation embraced not only the automobile industry but all lines of business in which consumers' credit plays an important part. He was assisted by a large staff, and the results of the research will be published shortly.

In issuing the invitations, Mr. Raskob says:

"Quite apart from its direct relation to our own industry, we feel that this is one of the most vital subjects underlying our social, economic and industrial life; that it is extremely important that everyone, particularly those of us who are responsible in a large way for our country's financial and industrial development as well as those of us who are engaged in studies of, and writings on, economic thought, should have a clear understanding of this important development which has grown so rapidly during the past 10 years. Professor Seligman ranks as one of our foremost economists and in undertaking this work, at considerable personal sacrifice, I feel he has rendered an important contribution to the science of business."

Federal Court Enjoins Spark Plug Rebuilders

DETROIT, Oct. 22—The practice of several concerns in New York and New Jersey of buying up discarded spark plugs, cleaning and rebuilding them and selling them as new was brought to a sudden end when the United States District Courts for the Southern district of New York and for New Jersey issued restraining orders against four companies and also ordered the seizure of more than 30,000 spark plugs which had been fixed up for the market.

The court actions were instituted by the Champion Spark Plug Co., and the AC Spark Plug Co.

American Brass Moves

DETROIT, Oct. 24—American Brass & Iron Co. will be in its new plant at 6500 Georgia Ave., by about Nov. 1, where it will have increased facilities for manufacture and service.

Men of the Industry and What They Are Doing

Oakland Names Lefebvre As Successor to Brandt

Gordon Lefebvre has been made vice-president in charge of operations of the Oakland Motor Car Co., succeeding A. J. Brandt, resigned. Mr. Brandt has not announced his future plans.

In taking his new position, Mr. Lefebvre has resigned as vice-president and general manager of the General Motors of Canada, Ltd., which he has held since March, 1926. He was with Chevrolet from 1919, first as general efficiency engineer and in 1924 he was placed in charge of Chevrolet's standards department where he had charge of all plant engineering production and inspection.

Mr. Brandt joined Oakland in 1925 and was in charge of operations during the period of Oakland's greatest expansion. Before going with Oakland, he had been associated for 10 years with Mr. Glancy in different large manufacturing operations.

T. L. Ford Promoted

T. Latimer Ford has been elected vice-president of American Hammered Piston Ring Co. For a number of years Mr. Ford was assistant secretary and treasurer of the company and for the past four years has had charge of the Pacific Coast territory. In his new position he will also have charge of automotive replacement sales.

Reeves Visits N. Y. Plants

Going on record as in favor of repeal of the wartime excise tax at the next session of congress, Alfred Reeves, general manager of the National Automobile Chamber of Commerce, talking tonight before the Rotary Club at Utica, N. Y., voiced his optimism on the outlook for tax relief and favorable trade next year. Mr. Reeves is visiting motor vehicle manufacturers in various New York cities.

F. R. Henderson Reelected

F. R. Henderson of Henderson, Helm & Co. has been reelected president of the Rubber Exchange of New York for his third executive term. Vice-president Charles T. Wilson and Treasurer J. Chester Cuppia were also reelected.

Sanders Joins Automatic Drive

Rudolph Sanders, engineer, formerly with X Laboratories, Inc., and other automotive organizations, has joined the Automatic Drive & Transmission Co., Inc., of Gloucester City, N. J.

Chambers Heads Boosters

New officers of the Chicago Boosters' Club No. 7 were elected at a recent meeting as follows: T. Frank Chambers, president; W. A. Bickel, vice-president; N. McKay Kneisly, treasurer; Hal Taylor, secretary, and D. J. McCarthy, assistant secretary.

Nash Workers Give Sedan to Prince

When Prince William of Sweden, visited Kenosha, Wis., on his lecture tour, he was given a Nash Advanced Six Ambassador sedan by the Scandinavian employees of the main works of the Nash Motors Co. in that city. The deed, appropriately engrossed, read as follows:

"On the occasion of his visit to the factory of the Nash Motors Co., of Kenosha, Wis., U. S. A., on Oct. 14, 1927, the Scandinavian employees of the company beg his Royal Highness, Prince William of Sweden, to accept as a token of their esteem and affection a Nash Advanced Six motor car, the product of a factory employing more workmen of Scandinavian birth or extraction, in proportion to its total force than any other automobile factory in the United States of America."

DePaolo Wins 1927 Honors

Peter DePaolo, speedway champion for 1925, has been awarded the honor again this year by the contest board of the American Automobile Association. Frank Lockhart again placed second, George Souders, third, Leon Duray, fourth, and Harry Hartz, fifth. DePaolo accumulated 1440 points, Lockhart, 1040, and Souders, 1000. Lockhart earned $43,110, Souders $31,800 and DePaolo $27,080 on the season.

Huffman on Southern Trip

Russell Huffman is visiting cities in Virginia, North Carolina, South Carolina, Florida, Georgia, Alabama, Mississippi, Louisiana, Tennessee, Kentucky and West Virginia consulting with automotive leaders on questions concerned with the activities of the Motor Vehicle Conference Committee, of which he is secretary.

Loening Establishes Prize

Grover Loening, president of the Loening Aeronautical Engineering Corp., New York, has established a prize fund of $5,000 for an annual award to the winners of an intercollegiate flying contest to be held each year by students representing American colleges.

Horning Goes Abroad

H. L. Horning, president of Waukesha Motor Co. and of the Motor & Accessory Manufacturers' Association, sailed today with Mrs. Horning on the Aquitania for England. James Fisher, chief engineer, and Arthur Pope, head of the research department, were also in the party.

Moskovics Toastmaster at Paris Salon Dinner

Social activities were numerous while the Paris Salon was in progress, dinners or luncheons being given by General Motors, Jordan, Willys-Overland-Crossley, Chrysler, Dodge, and Packard.

The annual salon dinner of the American Automotive Club of Paris, held at the Athenee Plaza Hotel, united 65 persons, among them being 10 presidents or vice-presidents of leading American automotive companies. Owing to illness C. W. Nash was unable to preside, and for the same reason C. F. Kettering could not attend. The toastmaster at the dinner was F. E. Moskovics, president of the Stutz Motor Car Co. of America, Inc., and among the speakers were R. A. Stranahan, president of Champion Spark Plug Co.; George Bauer, of the National Automobile Chamber of Commerce; E. C. Wilson, first secretary of the American Embassy, and Sir William Letts, of the Willys-Overland-Crossley, Ltd.

Cleveland Officers Named

Cleveland chapter of the National Aeronautics Association has elected the following officers: Floyd J. Logan, president; Horatio Ford, vice-president; Clifford Gildersleeve, secretary-treasurer; and H. A. Taylor, Harry S. Robertson, A. L. Merriam, Frank B. Maney, Thomas J. Herbert, and L. W. Greve, directors.

. Jones to Address S.A.E.

One of the most interesting sessions held by the Milwaukee Section, Society Automotive Engineers, is expected Nov. 2, when the guest of honor will be E. T. Jones, chief engineer, Wright Aeronautics Corp., Paterson, N. J.

Ray Leaves Federal

Thomas M. Ray, vice-president of the Federal Motor Truck Co. of California, Inc., at Los Angeles, has tendered his resignation. Mr. Ray is widely known on the Pacific Coast. His future plans are not announced.

F. J. Mooney Joins Seaman

F. J. Mooney has been appointed manager of the traffic department of the Seaman Body Corp., Milwaukee, affiliated with the Nash Motors Co., Kenosha, Racine and Milwaukee. He formerly was traffic manager of the Milwaukee Coke & Gas Co.

Townsend With Indiana

Ray F. Townsend has been appointed assistant to the president of Indiana Truck Corp. For the past several years Mr. Townsend has been connected with Federal Motor Truck Co., and prior to that was with the Willys-Overland Co.

Hupp Net $1,587,902 in First 9 Months

Spicer Company Shows Earnings of $1,023,198—Stewart-Warner Net $4,198,632

NEW YORK, Oct. 26—Hupp Motor Car Corp. reports for the quarter ended Sept. 30 net profit of $440,079 after depreciation and Federal taxes. This is equivalent to 43 cents a share earned on the 1,005,189 shares of common and compares with $1,010,816, or $1.10 a share on 913,809 shares in the third quarter last year. Earnings for nine months were $1,587,902 against $3,070,-879.

The report of Spicer Mfg. Co. and subsidiaries for nine months ended Sept. 30 shows profit of $1,023,198 after depreciation, etc., but before Federal taxes, compared with $1,498,718 in first nine months of 1926. Profit for third quarter totaled $309,567 after above charges but before Federal taxes, comparing with $372,324 in June quarter and $457,168 in third quarter of 1926.

Stewart-Warner Speedometer Corp. reports for nine months ended Sept. 30, 1927, net profit of $4,198,632 after depreciation, Federal taxes, etc., against $4,808,350 in first nine months of 1926. Net profit for the September quarter was $1,627,706 after above charges, comparing with $1,508,878 in preceding quarter and $1,686,535 in third quarter of 1926. Directors of Stewart-Warner have voted to retire on Feb. 1, 1928, the $875,000 7 per cent gold notes of the Bassick Alemite Corp.

Tire Factories Expect November Sales Upturn

AKRON, Oct. 26—Tire manufacturers in the Akron district have been steadily curtailing production to a point where most plants are running at 75 to 80 per cent of capacity. Total output of Akron factories is approximately 120,000 automobile casings a day, compared with about 135,000 during August.

Most observers believe the bottom of the current recession in the industry has been about reached, however, and a decided upturn is looked for in November. The long awaited advent of the new Ford car is expected to accelerate the demand for tires for original equipment in that month. Shipments on spring dating orders, which begin Nov. 15, should also help the retail trade.

Although original equipment business has fallen off sharply this fall, due to lower output of automobiles, several tire manufacturers have recently obtained large contracts from car makers for tires to be delivered as far as six months ahead. Booking of this business will put the industry in a better position to gage its demands during the coming months.

G.M.D. Book Shows Accessory Market

CHICAGO, Oct. 24—Compiled after several months of research by the commercial information and accessory divisions of the Greater Market Development of the Automotive Equipment Association a 112-page booklet showing accessories not on the various makes and body types of motor cars when they leave the factories has just been issued by G.M.D. The booklet shows that the market for accessories is great and that, as a matter of fact, few car makers are completely equipping their models.

Edward J. Dunn Dies, Made Bendix Drive

NEW YORK, Oct. 24—Edward J. Dunn, president of the Eclipse Machine Co., and subsidiary companies, died last week at his home in Elmira, N. Y. He was one of the pioneers of the automobile industry and, although of a quiet and retiring nature, his influence was very widely felt.

He was born Jan. 23, 1866, in Elmira, and engaged in various commercial lines during the early years of his business career. For 25 years he was in the banking business.

He organized the Eclipse Machine Co. to manufacture coaster brakes for bicycles. Later he supplied motorcycles with the device, and when Vincent Bendix brought out the Bendix drive Mr. Dunn placed his organization firmly behind its manufacture and sale. He also was a director of American La France Fire Engine Co.

Mr. Dunn was widely known in Elmira for his civic activities and at one time was president of the Rotary Club in that city. He retained his business energy and acumen to the time of his death.

Willys-Overland Profit $7,306,184 for 9 Months

TOLEDO, Oct. 27—Willys-Overland, Inc., reports profit of $7,306,184, after all charges but before Federal taxes, for the nine months ended Sept. 30, 1927. This compares with $10,811,280 in the first nine months of 1926. Profit for the September quarter was $1,250,-631 before Federal taxes, comparing with $2,229,329 in the 1926 quarter.

Sales in the nine months totaled 165,000 against 155,000 in the same period in 1926. Inventories Sept. 30 were lower than $16,000,000, the lowest in 12 years. Dealer stocks have declined 45 per cent since May and represent less than six weeks' production. Cash totals $18,386,735.

92.6 Used Cars Sold for Every 100 New

Chicago Survey Shows 34.1 Clean Deals—Trades on Trades 32.6 per 100

CHICAGO, Oct. 25—A preliminary compilation and analysis of figures obtained in a survey just completed by the Chicago Automobile Trade Association for the National Association of Finance Companies shows dealers were compelled to sell approximately 92.6 used cars for every 100 new cars sold.

This figure includes both the trade-ins of used cars on new cars sold and the trade-ins of used cars on other used cars. This is an increase of approximately 8 per cent over similar figures for last year. The period covered by the survey is from Jan. 1 to Sept. 30 this year.

Of every 100 new cars sold, 64.5 were sold on deferred payments—a percentage close to 1926 figures. Of every 100 used cars sold, 56.8 were sold on deferred payments. Used cars numbering 65.9 were traded in on every 100 new cars sold, and 32.6 used cars were traded in on every 100 used cars sold. Both these figures indicate a slight increase over the ratios for an approximately similar period last year.

During the period covered, the number of used car trade-ins exceeded the number of used car sales by less than 4 per cent. Of the used cars traded in, approximately 6.8 per cent were junked; and inasmuch as the total of used cars sold, plus those junked, exceeds the total of used cars taken in trade by some 3.3 per cent, it would seem that used car stocks had been decreased by approximately that amount.

Stutz and Hispano-Suiza to Meet in Match Race

INDIANAPOLIS, Oct. 26—A match race for $25,000 between a Safety Stutz and an Hispano-Suiza will be run on the Speedway here late in November. The race is to be a 24-hour stock car affair and American Automobile Association sanction is sought. Stutz drivers probably will be Gil Anderson and Frank Lockhart, and Major H. O. Segrave has been named to drive the foreign car.

The decision to test the two cars in a race was made between F. C. Moskovics, president of Stutz Motor Car Co. of America, Inc., and Hispano-Suiza officials in Europe.

Moto Meter Names Ervin

NEW YORK, Oct. 26—Henry Ervin, formerly general manager of Moto Meter Co. of Canada, Ltd., has been appointed general sales manager of the Moto Meter Co., Inc. The appointment of the new sales executive follows the resignation of E. V. Hennecke, vice-president and general sales manager.

Stout Lines to Join Many Leading Cities

Detroit-Cleveland Line First Unit of Series—Planes Carry Ten

DETROIT, Oct. 25—The Stout Air Services, Inc., on Nov. 1 will inaugurate daily airplane service between Detroit and Cleveland. The new line will be the first unit of a series of air transport lines to be established by the company which ultimately will connect Detroit with all important cities in the East and Middle West.

The present schedule calls for one round-trip from each terminal each day. Departures from Detroit and Cleveland will be at 9.15 a. m. and 3.15 p. m. daily. It is estimated that the 128 miles distance will be covered in approximately 90 minutes. Ford all-metal tri-motored monoplanes, with cabin accommodations for 10 passengers, will be used. The fare will be $18 one way or $35 round trip. Each passenger will be allowed 20 lb. of baggage and for each additional pound will be assessed 20 cents.

According to the plans, the next link probably will provide service from Cleveland to Pittsburgh, thence to Philadelphia.

A depot erected at the Ford airport has been leased by the Stout organization for the Detroit operations while the municipal airport at Cleveland will be the Cleveland terminal. The Stout company, which has maintained headquarters in the General Motors Building, will move to the Ford Airport as soon as the new service starts.

General Electric Offers New Battery Chargers

DETROIT, Oct. 24—A new line of garage type Tungar battery chargers has been announced by the merchandise department of General Electric Co. at Bridgeport, Conn. This line includes two new chargers for heavy duty work, a 15-battery and a 30-battery model which supersedes the 10- and 20-battery types.

The 15-battery Tungar has one regulating switch and one snap switch, it being merely necessary to turn on the alternating current supply and regulate the current. The 30-battery type, or double-duty Tungar, will give a full wave charge of 12 amperes to 15 batteries, permitting one-day charging. At this rate the current automatically tapers from 12 amperes to a low safe value. This charger will also charge 30 batteries at six amperes.

Stearman Moves to Kansas

WICHITA, KAN., Oct. 24—Stearman Aircraft, Inc., has moved its operations to this city from Venice, Cal., and has changed its name to Stearman Aircraft Co. The business was brought here to provide for better distribution and service of commercial airplanes. A production schedule of one plane each four days is now in force. Most of the product will be equipped with Wright Whirlwind engines and will sell for about $9,000. Lloyd Stearman is president and Mac Short, chief engineer. Present production is being taken by the Varney Air Lines.

French Makers Drop Cooperation Plans

PARIS, Oct. 14 (*by mail*)—Grouped together a few months ago in what was frequently referred to as a European General Motors, the syndicate uniting Unic, Delahaye and Chenard Walcker has been dissolved, at any rate so far as its original intentions are concerned. It was intended to have a common technical, purchasing and sales organization, but after a few months, difficulties arose between the firms and Unic has severed its connection with the group. Chenard Walcker and Delahaye will continue to cooperate on certain merchandising problems and it is believed that the project of a cheap car built jointly by the three firms and to be known as the Duc (representing the initials of Delahaye, Unic and Chenard Walcker) will be continued, although Unic has severed its connection with the scheme.

The Minerva and the F. N. companies, two of the leading Belgian makes, have signed an agreement under which they will not produce competitive models and will place their experimental and research departments at each other's disposal.

C. G. Spring Net $318,656 Sales for year $4,589,363

DETROIT, Oct. 24—Net profit of the C. G. Spring & Bumper Co., for the fiscal year ending Aug. 31, 1927, was $318,656, equivalent to $1.62 a share on outstanding common stock. This compares with $547,719 in the 1926 fiscal year or $3.08 a share. Gross sales in 1927 were $4,589,363 and net sales, $4,433,162. Net sales in 1926 were $4,858,510.

During the year fixed indebtedness was reduced $56,171. Preferred stock retirement provisions are anticipated including all of the year 1928 and part of 1929. Surplus was increased during the year $130,450. There were no bank loans and ratio of net current assets to liabilities was 2.8 to 1.

A.E.A. Issues Trade Manual

CHICAGO, Oct. 22—To enable the automotive equipment industry to take full advantage of the rapidly developing markets in the export field overseas, the foreign trade committee of the Automotive Equipment Association will issue the first foreign trade manual dealing exclusively with export markets for automotive equipment, according to E. C. Guthard, committee chairman.

Financial Notes

Chicago Pneumatic Tool Co. and subsidiaries, for nine months ended Sept. 30, report net profit of $669,451 after depreciation, Federal taxes and interest, equivalent to $7.03 a share (par $100) earned on 95,119 shares of stock. This compares with $713,405, or $6.62 a share on 105,412 shares outstanding in first nine months of 1926. Net profits for the September quarter were $238,899 after above charges, equal to $2.51 a share on 95,119 shares of stock, comparing with $271,117, or $2.57 a share, on 105,412 shares outstanding in third quarter of 1926.

Hudson Motor Car Co.'s net income for the nine months ended Sept. 30, 1927, after depreciation and all other charges, was $16,198,071. After Federal income taxes of $2,155,535 the net available for dividends was $14,042,536. The net income for the third quarter of 1927 only, after depreciation and all charges, was $4,870,306, leaving available for dividends $4,224,971 after Federal tax provision. Earnings in the nine months ended Aug. 31, 1926, were $7,984,002.

Mullins Body Corp. profit for the quarter ended Sept. 30, 1927, was $201,332 after expenses and interest but before Federal taxes, comparing with profit of $85,472 in the third quarter of 1926. Outstanding stocks consist of 9465 shares (par $100) of 8 per cent preferred and 100,000 no par shares of common. For the first nine months in 1927, profit before Federal taxes amounted to $523,712 against $235,200 in the first nine months of the previous year.

Seiberling Rubber Co. profit for the nine months ended Sept. 30, 1927, was $1,161,000 after charges, against $477,161 in the first nine months of 1926.

Curtiss Aeroplane & Motor Co., Inc., has applied to the New York Stock Exchange to list $2,523,100 of its preferred stock and 218,060 shares of common stock.

Baker to Build Planes

RACINE, Oct. 22—The R. G. Baker Co., manufacturer of radio cabinets, special furniture, etc., is turning over a large part of its operations to the construction of airplanes. An order for 100 ships has been placed by Ray Acre, Chicago, and the first is to be ready for trial flights at Air City, near Racine, on Dec. 15. The design is an enclosed cabin monoplane with radial air-cooled engines, carrying four passengers and having a cruising speed of 100 m.p.h. and a radius of 500 miles at 17 m.p.g. A large consignment of Oregon spruce is on the way to Racine and is expected to arrive Oct. 25.

Engineers See Norton Film

MILWAUKEE, Oct. 22—The feature of the annual meeting of the Engineers Society of Milwaukee on Oct. 19 was the exhibition of a four-reel film, "The Age of Speed," by courtesy of the Norton Co., Worcester, Mass., manufacturers of grinding machines.

Ohio Centers Show September Sales Off

Declines Are Reflected Against Previous Month and Last Year Totals

COLUMBUS, Oct. 24—According to tabulations of the Bureau of Business Research of Ohio State University, covering bills of sale on new cars sold in five of the most populous counties in Ohio in September, there was a marked decline in sales, not only as compared with September of last year but also compared with August of this year. Likewise there is a marked decline in sales of new cars in the nine months period from Jan. 1 to Sept. 30 of this year over last year's records.

Cuyahoga county, containing Cleveland, showed 1889 new cars sold in September, 1927, compared with 2955 in August. The decline from September of last year was 29 per cent while the decline in the nine months period was 14 per cent.

Hamilton county, containing Cincinnati, showed 1035 new cars sold in September, compared with 1335 in August. The decline from September last year was 20 per cent and the decline in the nine months period was 11 per cent.

Franklin county, containing Columbus, showed 693 new cars sold in September, compared with 847 in August. The decline from September last year was 34 per cent and the decline in the nine months period was 14 per cent.

Lucas county, containing Toledo, showed 548 new cars sold in September, compared with 672 in August. The decline from September last year was 35 per cent and the decline in the nine months period 18 per cent.

Summit county, containing Akron, showed 590 new cars sold in September, compared with 898 in August. The decline from September last year was 19 per cent and the decline in the nine months period was 7 per cent.

N. C. September Sales 2986

RALEIGH, N. C., Oct. 22—Sales of new passenger cars in North Carolina during September totaled 2986 as against 5711 in September one year ago and 3132 in August. Thirteen hundred Chevrolets were sold in North Carolina in September; 307 Buicks; 320 Essex; 191 Pontiacs; 185 Dodges; 164 Chryslers, and 77 Fords.

Fords have been practically taken off the market pending the delivery to the dealers of the long awaited new model. During September 3959 used cars were sold in North Carolina.

Olds Sales Gain 14%

LANSING, Oct. 24—Oldsmobile sales for the third consecutive month have broken previous records, both in the domestic and export fields, the factory reports. September output showed a gain of 14 per cent over that of the same month in 1926. The September gain follows substantial increases in July and August, both months recording larger sales than any previous August or July. During the first nine months of the year, Oldsmobile exports showed a gain of 20 per cent. This increase is in line with the total increase of the export business of General Motors Corp.

California Reports Registration Gain

SACRAMENTO, CAL., Oct. 24—Registration of passenger cars in California for the first nine months of 1927 reached 1,445,654, as compared with 1,331,220 for the same period in 1926, a gain of 114,433 cars. Total registration of automotive vehicles for this period of this year were 1,695,598, against 1,578,364 for the same nine months last year, an increase of 117,234, according to a report just issued by Frank G. Snook, chief of the State Motor Vehicle Division. Registrations up to October 1, 1927, of vehicles other than passenger cars were:

Vehicle	1927	1926
Pneumatic-tire trucks..	170,647	167,157
Solid-tire trucks.....	37,706	40,895
Motorcycles	8,977	9,871
Trailers	32,588	28,221

Fageol Shows 30% Gain

OAKLAND, Cal., Oct. 24—Fageol Motors Co. reports an increase of 30 per cent in sales for the first nine months of 1927 over those of the entire year of 1926. Branches have been established recently in Seattle, Portland, San Francisco, Los Angeles and downtown Oakland.

Rollway Opens New Office

CLEVELAND, Oct. 24—Rollway Bearing Co., Inc., Syracuse, has opened a sales office in the Leader Bldg., here, for the convenience of its customers in the Cleveland district. R. D. Faris has been named Cleveland representative.

Finds Uncertainty Causes Sales Slack

Milwaukee Bank Sees New Ford Releasing Important Deferred Demand

MILWAUKEE, Oct. 22—"It seems probable, in view of all the circumstances, that the present slack in automobiles is due to uncertainty more than to any lack of potential demand," is the conclusion reached by the economist of the largest Milwaukee bank, the First Wisconsin National, and expressed in the monthly survey of local business. Referring to the automotive trade, the summary says:

"Total automobile production continues below a year ago and sales are reported to have tapered off toward the end of last month. It is generally believed that when the new Ford is out, a large deferred demand, not only for Fords, but for other cars, will be released. While total production of cars so far this year has fallen about 17 per cent below last year, a number of leading producers, especially in the medium-price class, have enjoyed an increase in business over last year. It seems probable, in view of all the circumstances, that the present slack in automobiles is due to uncertainty more than to any lack of potential demand."

The survey also says that "employment as indicated by total figures held up very well in September. Placements of persons in positions were more numerous that in August, but less than in September last year. Demand for skilled workmen in the metal trades showed a falling off.

Brown Opens K. C. Branch

KANSAS CITY, Oct. 24—The Brown Instrument Co., makers of electrical instruments, has opened a branch here at 509 Mutual Bldg., with F. M. Poole as district manager.

Overseas Shipments of Uncrated Automobiles Fast Becoming Popular, Says Government Report

WASHINGTON, Oct. 24—The possibilities of exporting automobiles unboxed, and the advantages pro and con has been made the basis of a survey by the automotive division of the Department of Commerce, the following being an extract from the report:

"A number of leading American automobile exporters have found economical and efficacious the practice, which is fast becoming popular, of shipping overseas their cars unboxed on steamers especially equipped for and catering to this class of freight. Such service is now available and through freight rates are quoted from the factories to the most important continental European ports.

"Fully assembled cars are driven on board, under, their own power, and lowered to the proper deck, parked and fastened down in space previously allotted to them. This method of shipment has several outstanding advantages; a complete assembly and test at the works is possible; a saving of approximately $50 a car in the total shipping cost is effected by dispensing with boxing, the risk of damage is decreased, as evidenced by the fact that insurance premiums have been reduced from ⅝ to ⅛ per cent and the discharge, delivery and clearance of cars so shipped through the customs is accomplished quicker and cheaper than with boxed cars."

Cleveland Plants Increase Activity

CLEVELAND, Oct. 22—Depression in the automotive parts business in the vicinity is lifting. The first evidence is noted in the return of 400 men to the rough mill of the Fisher Ohio Body Co., and notice to several hundred to be on deck in the next two weeks. P. J. Mauck, works manager of the company, estimated top production Jan. 1. This will greatly affect Empire Steel Co., business. The production of 3500 tons of steel a month by the mill is used by the body company.

Otis Steel Co. has received an order for 600 tons of rolled steel for the Ford plants. Gabriel Snubber Co. has been speeding up to take care of orders placed by Willys-Overland and Oakland-Pontiac. Eaton Axle & Spring Co. reports its export business increased 10 per cent. Geometric Stamping Co., which supplies sheet steel tubes for automobile manufacturers, reports a retooling of the plant in preparation for Nov. 1 orders.

Chromium Officers Named

NEW YORK, Oct. 26—Officers of United Chromium, Inc., have been elected as follows: F. S. Wheeler, chairman of board; F. H. Hirschland, president; A. E. Baldwin, vice-president; John T. Pratt, Jr., secretary; F. M. Becket, treasurer, and W. H. Billings, assistant treasurer. Committees on research, patents and protection of patents were appointed.

Transfer Compass Company

AURORA, ILL., Oct. 22—The Waterbury Auto Compass Corp. has been formed here with $100,000 capital to handle a compass, now manufactured at South Bend, Ind., which indicates direction of travel.

Coming Feature Issues of Chilton Class Journal Publications

Nov. 10—Marketing Annual—Motor World Wholesale

Feb. 18—Statistical Issue—Automotive Industries

Jan. 1—National Shows Number—Automobile Trade Journal.

Jan. 5—National Shows Issue—Motor Age.

Jordan and Moock Head Overseas Club Speakers

NEW YORK, Oct. 24—Edward S. Jordan, president of the Jordan Motor Car Co., and other prominent speakers are on the program of the Automotive Equipment Association show dinner to be given by the Overseas Automotive Club, Inc., Nov. 9. This dinner is an annual affair with the primary object of entertaining the guests from foreign countries who attend the show.

Other speakers are Harry G. Moock, Greater Market Development, Automotive Equipment Association; Commissioner William M. Webster, A. E. A., and C. M. Wynne, Overseas Industries, Inc., Chicago.

Dictators Better 60 M.P.H.

AMATOL, N. J., Oct. 25—Studebaker Dictator stock models in a test here under sanction of the American Automobile Association maintained a speed of 61.79 and 61.73 m.p.h. for a full 24 hours. The models were a sedan and a coupe, the former showing the slightly greater speed.

G.M. Truck Officers Meet Branch Heads

ST. LOUIS, Oct. 22—A two-day convention of branch managers of the General Motors Truck Co. in the central states was held at the Jefferson Hotel here this week. The meeting was one of a series of three being conducted by General Motors Truck Co. covering the whole United States.

The factory was represented by Paul W. Seiler, president and general manager of General Motors Truck Co.; V. G. Phillips, general sales manager; Harry Warner, factory works manager, and H. C. Bradfield, director of advertising.

The purpose of the meeting was to acquaint branch managers with the production developments at the General Motors Truck factories and with its sales policies for the future. Also the factory official learned from their managers an estimate of trade prospects in their various territories. These estimates were optimistic.

N. S. P. A. Space in Demand

DETROIT, Oct. 22—Despite the fact that the Cleveland Auditorium provides 6000 more square feet of rentable space for the National Standard Parts Association Show than the association had last year, it is certain that still additional space will have to be secured to accommodate applications. The N. S. P. A. expects to have 300 members by show time, Nov. 14.

Franklin at Capacity

SYRACUSE, Oct. 22—Franklin Automobile Co. reports unfilled orders for its new Airman models three weeks ahead of production. Factory operations are at capacity with many departments operating on a full six-day week schedule with overtime.

Calendar of Coming Events

SHOWS

All Western Road Show, Los Angeles ..... March 7-11
American Road Builders Association, Public Auditorium, Cleveland..Jan. 9-13
Argentine .....Nov. 10-20
Automotive Accessories Association, Armory, Chicago .....Nov. 7-12
Automotive Equipment Association, Coliseum, Chicago .....Nov. 7-12
Berlin, Exhibition of Engineering Materials .....Oct. 22-Nov. 13
*Boston, Mechanics Bldg. .....March 10-17
*Chicago, National Automobile Chamber of Commerce, Coliseum ..... Jan. 28-Feb. 4
Glasgow .....Nov. 4-12
International Aircraft Show, Berlin ..... March 23-April 11
Lille, France, Exposition..Nov. 20-Dec. 4
London Truck Show .....Nov. 17-26
Montevidio .....Nov. 19-27
National Standard Parts Association, Convention Hall, Cleveland..Nov. 14-18
*New York, National Automobile Chamber of Commerce, Grand Central Palace .....Jan. 7-14
Rio de Janeiro .....May 3-13
Salon, Automobile Salon, Inc., Hotel Drake, Chicago .....Jan. 28-Feb. 4
Salon, Automobile Salon, Inc., Hotel Biltmore, Los Angeles .....Feb. 11-18
Salon, Automobile Salon, Inc., Hotel Commodore, New York..Nov. 27-Dec. 3
Salon, Automobile Salon, Inc., Palace Hotel, San Francisco..Feb. 25-March 3
United States Good Roads Show, Des Moines .....May 28-June 1

*Will have special shop equipment exhibit.

CONVENTIONS

American Management Association, Palmer House, Chicago .....Nov. 1-4
American Road Builders' Assn., Hotel Hollenden, Cleveland .....Jan. 9-13
American Road Builders' Association, Banquet, Hollenden Hotel, Cleveland .....Jan. 11
American Society of Mechanical Engineers, Annual Meeting, New York City .....Dec. 5-8
Associated Manufacturers of Fabric Auto Equipment, La Salle Hotel, Chicago .....Nov. 5
Automotive Equipment Association, Coliseum, Chicago .....Nov. 7-12
Berlin, Conference on Engineering Materials .....Oct. 22-Nov. 13
National Association of Finance Companies, Congress Hotel, Chicago ..... Nov. 14-15
National Foreign Trade Council, Houston, Texas .....April 25-27
National Research Council, Washington, D. C. .....Dec. 1-2
National Standard Parts Association, Hotel Hollenden, Cleveland..Nov. 14-18
National Tire Dealers' Association, Brown Hotel, Louisville, Ky..Nov. 15-17
Overseas Automotive Club, Inc., Overseas Visitors' Dinner, Stevens Hotel, Chicago .....Nov. 9
Overseas Automotive Club, Inc., Monthly Luncheon, Hotel Astor, New York .....Dec. 8
United States Good Roads Association and Bankhead National Highway Association, Des Moines..May 28-June 1
World Motor Transport Congress, London .....Nov. 14-17

N. A. D. A.

Chicago, Jan. 31-Feb. 2—Annual, Palmer House.
Chicago, Feb. 1—Banquet, Palmer House.
New York, Jan. 9-10—Eastern District, Hotel Commodore.

S. A. E.

National

Chicago, Dec. 1—Tractor Meeting.
Detroit, Jan. 24-27—Annual Meeting.
European trip—Nov. 2-Dec. 12
New York, Jan. 12—Annual Dinner.

Engineering Libr

News of the Industry Begins Page 698

NOV 9 1927

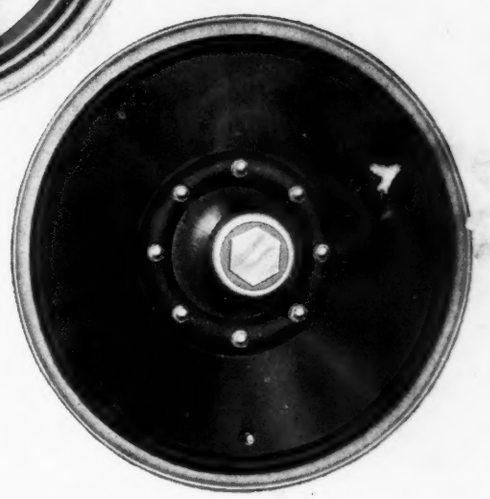
AUTOMOTIVE INDUSTRIES

Volume 57
Number 19

PUBLISHED WEEKLY AT CHESTNUT AND 56TH STREETS
PHILADELPHIA, NOVEMBER 5, 1927

35c a copy
$3.00 a year

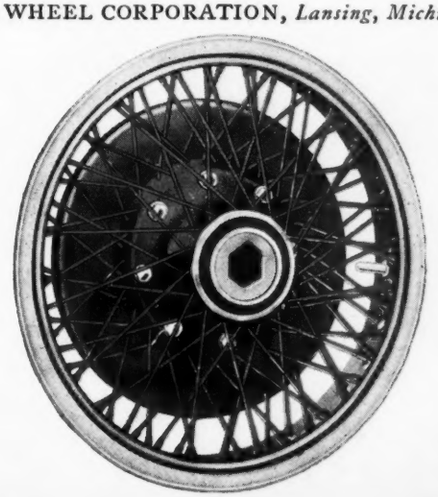
Motor Wheel PRODUCTS



THE Motor Wheel line of completely interchangeable wood, steel and wire gives the fine car builder a potent new sales closer .... and shows the Industry still more of that brand of thinking and action which Motor Wheel puts into every wheel problem.

From this one source of supply any line of cars can be perfectly equipped with wheels of any types. The first make of wheels for balloon tires is more than ever the first to be considered.

MOTOR WHEEL CORPORATION, *Lansing, Michigan*



Motor Wheel

Entered as second-class matter Oct. 1, 1925, at the post office at Philadelphia, Pa., under the Act of March 3, 1879

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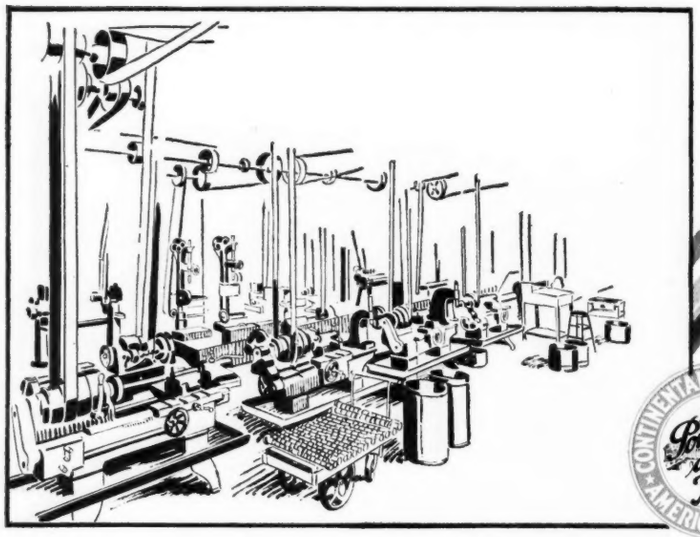

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An important factor in machining camshafts.

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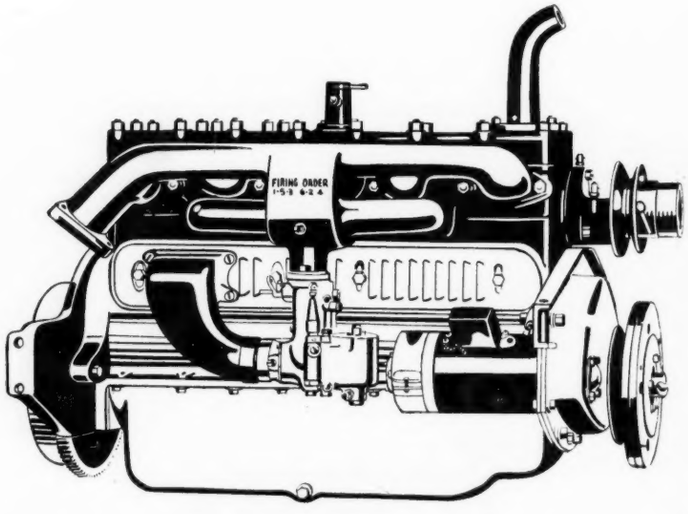
The Largest Exclusive Motor Manufacturer in the World



Continental Motors

AUTOMOTIVE INDUSTRIES
VOLUME 57 *Philadelphia, Saturday, November 5, 1927* NUMBER 19

Bus *and* Truck Operators Urge Standardized Design

Makes for greater efficiency and economy they declare at S. A. E. transportation meeting in Chicago. Fleet owners' problems are discussed.

By M. Warren Baker

EFFICIENT operation of trucks and buses demands standardized design. Uniformity of strength throughout the vehicle is highly desirable.

Those taking part in the Society of Automotive Engineers transportation meeting in Chicago, Oct. 25, 26 and 27, presented a common front on these two particular points.

They indicated that motor truck development soon will overcome topographic and climate forces and reach the stage where units will operate just as effectively in tropic or desert, on prairie or mountain.

Design in relation to maintenance was discussed by several speakers, some from the standpoint of territorial requirements, others from the standpoint of industrial or official uses and needs. Container handling of freight, terminal problems, long distance transportation, state regulation of common carrier trucking, army transportation and maintenance, rail car design, operation and fuels, and motor coach design and legislation were among the subjects covered at the various sessions.

A. J. Scaife of the White Co., discussed the difficulty of providing vehicles which will meet completely every transportation requirement. He decried the practice of changing tire equipment so that the vehicles could be legally overloaded. He mentioned that thus far it has been impossible to give all units the same service life before reconditioning, although from a maintenance standpoint this would be highly desirable.

Difficulties of fleet operation and maintenance in the Pacific Coast States, due partly to topography, were discussed at several sessions by E. C. Wood of the Pacific Gas & Electric Co. He stressed the importance of using the right vehicle for the job and the organization of proper maintenance departments. Due to the topography of the Pacific Coast region, transmissions, engines and axles are put to extremely severe service.

In presenting a detailed analysis of the difficulties and troubles which operators in his district are experiencing with equipment, Mr. Wood cited some problems which need factory engineering attention. Defects in headlighting equipment were blamed by this speaker as the principal cause of the present unsatisfactory situation. He admitted, however, that there was a noticeable improvement in the lighting equipment on the 1927 models.

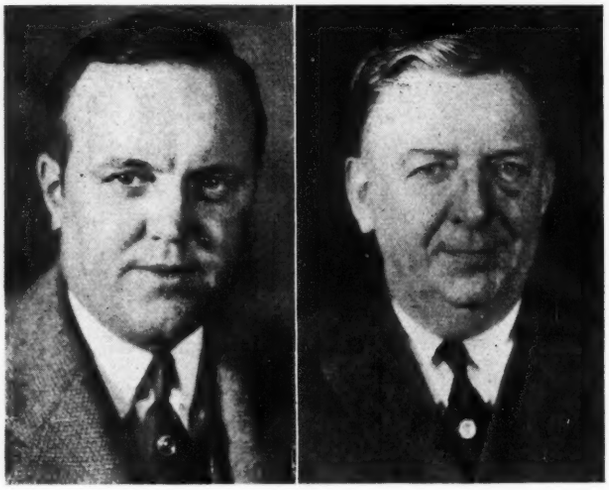
K. J. Ammerman (left) and E. C. Wood. The former read a paper on motor coach design at the S. A. E. transportation meeting, while the latter discussed fleet operation and maintenance in the Pacific Coast States

He explained that six-cylinder engines, pneumatic tires, higher operating speeds, additional transmission speeds, four-wheel brakes, four-wheel drive and six-wheel construction are among the trends in design that are meeting with favor on the Pacific Coast.

Among the features operators on the west coast are desirous of obtaining in motor buses are greater accessibility, more even balance of the lives of various units, greater cooling capacity, elimination of fumes, easier body repairs

and better brakes, the last factor being their largest element of maintenance expense. Longer battery life is desirable and the use of thicker plates and separators and larger capacity was recommended.

In the discussion following a paper on motor coach design by K. J. Ammerman of the American Car & Foundry Motors Co., H. L. Debbink of the Milwaukee Railway & Light Co., urged that motor coach controls be standardized. He explained that where different makes are in service, variations in control add to the difficulties of educating drivers, and where drivers are interchanged, if all controls are alike the drivers can devote their entire attention to traffic conditions, adding to the safety and efficiency of operation.



Left—E. L. Murphy, Jr., who spoke on common carrier trucking under State regulations. M. T. Hanrahan (right) discussed tractor-trailer-container terminal handling of freight

In this connection he mentioned such details as hand brake location and operation, steering column rake, position of driver's seat, pedal pressure, location of horn button, etc., all of which vary widely in different designs. In many instances, Mr. Debbink said, the location of the gasoline tank should be changed and it should be easier to measure what it contains. He said often tank fillers are designed so that gasoline cannot be pumped in as rapidly as desirable.

Starting his paper on motor coach design with the statement that the manufacturer must provide the rider with a safe, comfortable ride and provide the operator with an economical, durable and amply powered coach, Mr. Ammerman declared that profit is the present yardstick used to measure the success of the manufacturer's efforts in design.

Mr. Ammerman said that motor coach engineers can and have improved on construction in the use of better material and finer workmanship but that they are limited in this respect by the desire of the operator to buy at the lowest possible initial cost. Fine workmanship and high grade material are least visible to the operator where they do him the most good. He declared that operators are continually after more speed but do not appreciate what the gratification of their desires will cost. A safe coach at 40 m.p.h. may not be safe at 55.

Mr. Ammerman compared the evolution of the steam deceleration. He explained that for this reason coaches must be built heavier and it is therefore inevitable that the cost will be proportionately higher.

Simplicity in chassis design was classed as a highly desirable development, without recommendation, however, as to the design and location of the various units making up a complete chassis. Division of opinion, for instance, as to the best place for the transmission, or as to design of the rear axle was admitted, it being Mr. Ammerman's stand that it was neither necessary nor desirable to discuss such argumentative points.

The author of this paper did frown, however, upon the tendency to design coaches with excessive rear overhang. He insisted that regardless of state regulations allowing it, motor coach designers should curb this tendency as it increases rear tire wear and makes turning difficult. Proper weight distribution was emphasized, especially inasmuch as the tires usually specified on the heavy type of coach are of a size just sufficient to carry the load. Passenger comfort also was stressed as being the principal factor which sells rides.

Long wide springs with a period of vibration most nearly approaching that to which the human body is most accustomed—walking—were recommended. Mr. Ammerman said that seat cushions are the predominating factor from the body standpoint and that too little attention is paid to the difference between seat cushion vibration period and chassis spring periods. The importance of testing the riding qualities of a seat when the coach is running on the road and not when it is standing still cannot be underestimated, according to the speaker. Baggage capacity is another problem which designers are facing with somewhat diffident results, Mr. Ammerman believed. Appearance as a method of inspiring confidence of patrons was stressed and the standardization of bodies was called essential to economic manufacture.

Exhaust and Transmission Noises

In this discussion of Mr. Ammerman's paper exhaust and transmission noises were criticized. The need for sturdier clutch and transmission construction was brought out. It was the consensus that passenger movement within the coach should be given more attention in order that loading and unloading might be speeded. Ventilation in hot weather was discussed, it being suggested that some development similar to the Fisher VV windshield might improve conditions.

Some interesting tests on the stresses set up in bodies by frame flexure were described by Mr. Norris of the Haskelite Mfg. Co. The stiffness of the body, he found, is about six times that of the chassis. With the body supported at its ends, when the passenger load enters the bus, the frame tends to flex more than the body with the result that the body pulls up on the outriggers with a force sometimes as great as the passenger load. He believed this condition could be improved by placing the rear wheels of the vehicle substantially under the center of gravity of the load.

An interesting method of testing equipment before purchase was offered by G. R. Gwynne of the Continental Oil Co. This concern is engaged in production, refining and marketing oil in the mountain states and in the central states directly east of the Rockies. Its territory is organized into motor equipment divisions with headquarters at Denver. Each division has a completely

has been established providing varied operating conditions. These conditions are very severe, as the territory includes high mountains, deserts, wide climatic variations and extremely poor roads. The company keeps cost and operating records at the Denver office on each article of equipment purchased, comparing the efficiency of each.

Flying Business Discussed

Despite the fact that there are now 15 air transport companies in the United States operating over 10,000 miles of regularly flown routes with many feeder lines, L. D. Seymour, of National Air Transport, said that cost and lack of confidence in the safety of flying are the two prime obstacles in the way of passenger carrying. Mr. Seymour cited the fact that there are now 4000 miles of lighted air ways and that 3000 miles will be added by next June and 5000 more in the following year.

Brig. Gen. F. H. Pope of the Quartermaster Corps, U.S.A., declared that despite the tremendous productive capacity of the automotive industry, it is not sufficient to meet the requirements of the army in time of war. He said that is because the army's requirements do not parallel those of the general public. Passenger car and light truck needs could be met but in the heavy-duty types and four-wheel and six-wheel designs productive capacity is insufficient, inasmuch as 80 per cent of the army's truck needs fall in sizes of more than 1 ton, while 80 per cent of the industry's production is of 1 ton or less.

He explained that in time of war commercial transport would take care of requirements in the interior zones but that military transport would be necessary in the war theatre. In this theatre the general estimated that 50 per cent of service would be on hard roads, 35 per cent on ordinary roads and 15 per cent across country. He insisted that vehicles must be available to function under these conditions. He stressed the importance of standardization of equipment and the organization of efficient maintenance service.

Gen. Pope told of army development of six-wheel, four-wheel drive units for high speed heavy-duty service. He explained that this type is less destructive of the roads, an important consideration in war time. He said the four-wheel drive units are essential as artillery tractors and for operation over bad roads. He urged that motor transport be regarded as an extension of rail service, inasmuch as both types are mechanical and therefore the experience of animal drawn transport is of little significance.

Army System Described

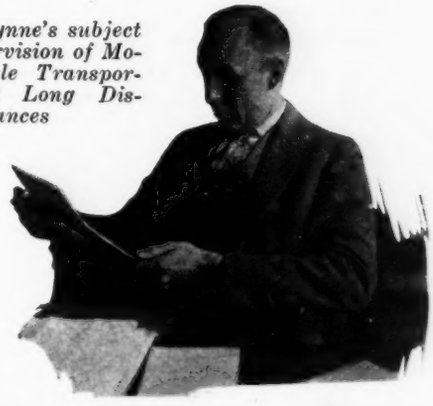
The army system of maintaining motor transportation equipment was described by First Lieut. Walter C. Thee, MSAE, Quartermaster Corps, U.S.A., as simply an application of the fundamental principles of industrial organization and management to a particular problem. He explained, however, that the army is able to maintain its equipment in all parts of the world with soldier labor, at a cost much less than that of any other large operator of similar equipment. The lieutenant presented a complete description of organization, methods, personnel, shop equipment and management employed by the army maintenance division at Camp Hollabird, Md.

Economic influences have forced railways to adopt the self-propelled railway car, according to H. C. Crowell, short journey passenger business is the outstanding result of the increase in automobiles and motor coaches in public favor.

Walter C. Sanders, general manager of the railway division, Timken Roller Bearing Co., was the author of a paper on design and operation of these self-propelled cars. He showed that whereas the average operating cost of steam passenger trains is about $1.25 per mile, the average cost per train mile of gas-mechanical cars is 40 cents a mile and 47 cents a mile for gas-electric cars. Mr. Sanders discussed certain well defined trends in design and construction as compiled from specifications of the 600 rail cars now in service on American railroads, not only in reference to the cars themselves but to the powerplants with which they are equipped as well.

He explained that the general tendency in the design of the cars themselves seemed to be toward increasing sizes and capacity, within limits set by varying economic conditions on different roads. Other principal developments were summarized as increased strength in construction, simple and more accessible arrangement of powerplants and adoption of modification in design that will aid in more efficient operation and in reducing maintenance, expense and service delays.

The direction of development in powerplants was described as being principally in greater simplicity of control and better fuel economy. Reliability of operation and low maintenance charges were stressed as the prerequisites of the self-propelled car. It was suggested that it might even be logical to add 10 per cent to the first cost of the car if this would insure more reliable mechanical performance. The relative advantages of gas-electric cars and gas-mechanical cars were discussed in some detail.



G. R. Gwynne's subject was Supervision of Motor Vehicle Transportation at Long Distances

In the discussion of the reports of both the sub-committees on regulation and accounting the question of the proper scope of the Society's activities came in for considerable discussion. An interesting statement of policy was included in the report of the operation and maintenance sub-committee on regulation as follows:

"The operation and maintenance sub-committee on motor vehicle regulation was organized to act in a technical advisory capacity to the several other bodies which are attempting to bring about more uniform and correct motor vehicle regulation.

"There is no thought that this sub-committee shall attempt directly to secure the passage, amendment or repeal of any bill or law. The committee recognizes that if its study is to be of benefit it must be co-ordinated with the work which has been done along this line and must be in cooperation with the bodies which

Wide Use of Aluminum is Feature of New Pierce-Arrow "81"

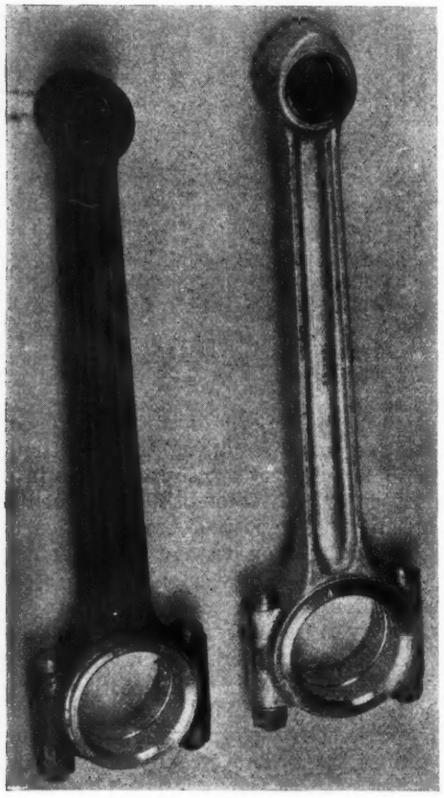
Weight of engine greatly reduced and performance improved by recent changes. Bodies are materially altered.

By A. F. Denham

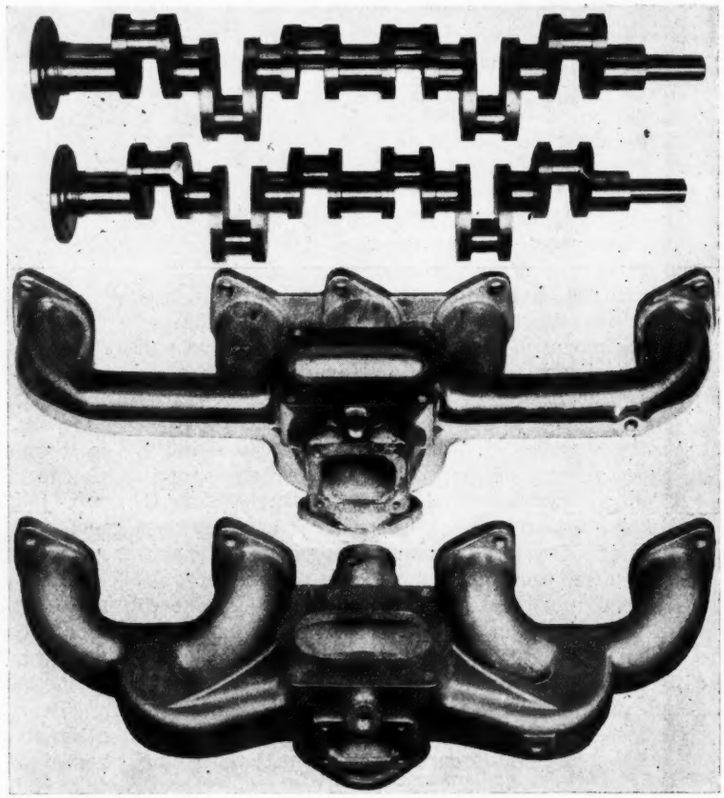
NEW body designs and a new engine of improved performance feature the Pierce-Arrow "81," a development of the "80" which is now being shipped to dealers. The former rather high body lines have been eliminated and lower bodies, attractively curved and streamlined, are now offered. Price revisions have been both upward and downward, resulting in a narrower price range for the complete line. Prices of the various models are as follows:

Runabout	$2,900
Four-passenger touring	3,100
Five-passenger brougham	3,250
Two-passenger coupe	3,250
Rumble-seat coupe	3,350
Five-passenger sedan	3,350
Sport sedan-landau	3,350
Convertible roadster	3,450
Seven-passenger sedan	3,450
Four-passenger coupe	3,450
Club sedan	3,300
Club sedan-landau	3.400
Seven-passenger inclosed drive limousine	3,550

Of the mechanical changes which have been incorporated in the new series, the most interesting perhaps is the extensive use of aluminum alloys. To the aluminum crankcase, transmission housing and clutch cover plates, have been added an aluminum cylinder head, forged aluminum alloy connecting rods and aluminum Invar-strut three-ring pistons. The inlet manifold also is of aluminum. As a result, not only has the power-



The new aluminum alloy connecting rod at the right is 11½ oz. (27 per cent) lighter than the steel rod formerly used



Above—Comparison of the crankshafts. The lower one is the larger shaft used in the Series 81. Below—In the new intake manifold of the 81 shown at the top all cylinders are equidistant from the carburetor

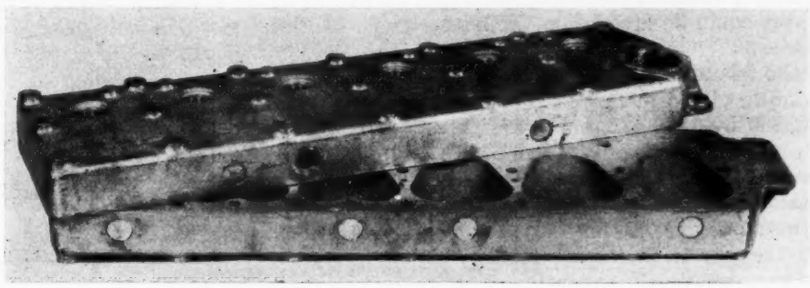
plant been lightened considerably, as indicated by an almost 50 per cent decrease in weight in the cylinder head alone, but greater smoothness of operation has been secured. With the total weight of the piston and connecting rod assembly reduced from 4 lb. 8½ oz. to 3 lb. 1 oz., and a simultaneous increase in crankshaft size, main bearings now being 2⅝ in. as against 2⅜ in. and crankpin bearings 2⅛ instead of 2 in., it has been found possible to eliminate the torsional vibration damper.

The performance of the engine has been materially increased by improving the manifolding and the carburetion. The use of an aluminum head has made it possible to increase the compression ratio from 4.45 to 4.65 to 1. The inlet manifold is so designed that all cylinder parts are equidistant from the carburetor. The central portion is provided with a heat control jacket using exhaust gases. The new carburetor, designed for Pierce-Arrow by Stromberg, embodies a thermostatic accelerating well control and has a larger, 1½-in. outlet diameter.

The increase in the available power results from the fact that the engine now peaks at higher speed, which results in increased car speed. With the adoption of aluminum pistons and an increased brake mean effective pressure piston pins have been increased in diameter from ⅞-in. to 1 in. It should be mentioned also that while the crankshaft diameter has been increased as much as ¼-in. at some sections as mentioned, the total weight of the shaft has been increased only 3 lb., since Pierce-Arrow shafts are drilled out, and the drill holes through main and crankpin journals also have been increased in diameter. Equalization of combustion chamber volume in the various cylinders is obtained by locating from the top of the combustion chambers in the second and fifth cylinders while machining the head. By so doing care is taken of any distortion of the head in cooling or casting that may not have been corrected when the cylinder head was straightened after casting and before machining.

Transmission and clutch remain unchanged, except for the fact that a rubber disk is incorporated in the driving member of the clutch and the gear change lever has been lengthened 2 in. for easier shifting. In the rear axles the major change is due to the adoption of a 58-in. tread instead of the former 56¾ in., to enable widening of the rear seat. Gear reduction remains unchanged although smaller diameter 20-in. wheels, with heavier spokes, and fitted with 32 x 6.00 in. six-ply balloon tires, are now used. This is reflected in markedly improved acceleration. Front axles, springs and frame continue unchanged. A Gemmer steering gear of the Marles type with 18 to 1 reduction has been adopted. This gear is of the hour-glass worm and roller type with the roller mounted on ball bearings.

One very interesting feature of the new chassis is the adoption of the Bowen one-shot lubrication system. Pierce-Arrow uses a semi-liquid grease instead of cylinder oil with this system. This grease which is to be handled by Pierce-Arrow service stations, is similar in its characteristics to 600 W. Twenty chassis points are lubricated by the system, which is supplemented by Zerk fittings on drag links, tie rod and universals only. The central reservoir of the one-shot system on the Pierce-Arrow is located under the hood, so as to keep the lubricant sufficiently warm for efficient operation in cold weather. The plunger is of the foot-operated displacement type and the pressure is somewhat higher than that used in the oil system.



Two views of the new cylinder head used on the Series 81. It is of aluminum alloy

Reserve Fuel Tank

Among minor changes in the chassis is the provision of a 3-gal. reserve tank in the gasoline tank, operated by a valve at the tank. These three gallons are indicated in red on the electric dash gasoline gage. A primer control is provided in addition to the choke, a pipe connecting the vacuum tank to the manifold direct and being operated by a button on the dash. The light control switch is located on the instrument board, and is supplemented by a foot-operated dimmer switch directly over the clutch pedal.

As to performance, the car has a touring speed of well over 50 m.p.h., a top speed of 65 m.p.h. or better under average conditions, and much improved acceleration, the time required to accelerate from 10 to 40 m.p.h. having been decreased from 15.9 sec. to 12.1 sec.

In the new bodies decreased height and more pleasing lines are at once apparent. By the use of smaller wheels and shorter body pillars—made possible without decreasing head room by increasing the slope of seats—the bodies have been lowered a full 2 in. An interesting design is used in the body framework of the rear quarters. The part of the body sill over the rear wheel housing has been replaced by an aluminum casting, thus making possible a considerably larger slope than with the usual deep wooden sill.

As formerly, body construction is of aluminum panels over white ash. The sun visor is built into the roof and is unusual in that it has a sharp downward curve, this curve flattening out gradually in the roof proper. The rear of the roof also is curved, and the tops of both front and rear windows are curved to follow the roof lines. The characteristically low belt line of former Pierce-Arrows has been raised relatively, and the resultant decreased height of the windows contributes materially to a more pleasing appearance. The fenders, both front and rear, also have been given more sweeping lines, in accordance with the modern trend.

The front view of the cars has been improved with a narrower radiator, more rounded off on top to carry out the general plan of eliminating sharp corners in the body design.

An innovation for the Pierce-Arrow Motor Car Co. is the adoption of a radiator emblem, which represents the coat-of-arms of the Pierce family. While the characteristic headlights built into the fenders are still optional if desired, the new cars have conventionally mounted lights. When lamps built into fenders are desired

small auxiliary lamps are also provided, mounted on the cross arm between the fenders. Head lamp rims are wider than formerly and at the top project slightly in front of the lens.

The louvres have been decreased in number and have been made more decorative by contrasting color striping. Window reveals are of the same color as the body panels, but are offset by extensions of the wide belt molding framing the windows. The belt molding is also carried forward on the head to the radiator shell.

Interiors of cars are artistically trimmed. Saddle spring seats are standard. Rear quarters have arm rests, and the seat backs are curved at the sides for greater comfort. Instruments are grouped under an attractive central panel. Attractive walnut wainscoting is used on the doors and under the rear quarter windows on the brougham. Standard equipment includes front bumpers; Houdaille shock absorbers all around; full cross type double windshield wiper; engine temperature indicator on the dash; combination tail, stop, and backing lamp; dash gasoline gage; thermostatically controlled radiator shutters, and a trunk rack. Side type tire carriers with fender wells are available when desired although an extra charge is made.

Plan Suggested for Floating Airplane Stations and Recreation Grounds in Atlantic

A GERMAN, Dr.-Ing. Roland Eisenlohr, makes the interesting suggestion that safe and convenient air service could be established between Europe and America on a regular commercial basis in a comparatively short time if Germany, France and England each would build one floating flying station in the Atlantic, and the United States would build two, making a total of five such havens between the two continents.

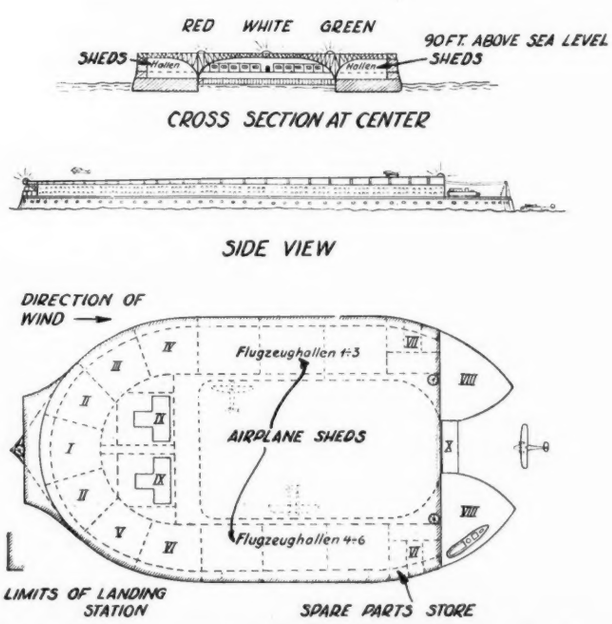
Writing in *Der Motorwagen*, Dr. Eisenlohr says the islands should be not more than 400 miles and preferably only 350 miles apart. In that case, if planes were used which are still fairly efficient at 600 miles—that is, which, when they have to carry fuel only to carry them safely for 600 miles, are capable of carrying a reasonable pay load—it would be necessary only to stop at every second station, thus making only two intermediate landings between Europe and America. Assuming a total flying time of 20 hours, the passengers, he thinks, would appreciate an opportunity of getting out of the plane twice for an hour, and the rest would be of benefit also to the pilot and the engine. With an actual flying time of 20 hours the two hours lost by the intermediate landings would be of no consequence.

Speaking of a design which he has worked out for the islands, Dr. Eisenlohr says: "In my estimation, in order to make ocean transport economically possible, we will soon have to use multi-engined land planes instead of the heavy seaplanes. Of other types only good, seaworthy flying boats with several engines deserve consideration. Landing facilities must be provided for both. The seaplanes would enter the quiet inner basin through a sort of sluice gate. That would not be particularly difficult. The taking off would be considerably more difficult. However, for this purpose sufficiently quiet waters might be found in the lea of the island, or else catapulting apparatus could be erected on the landing platform for airplanes.

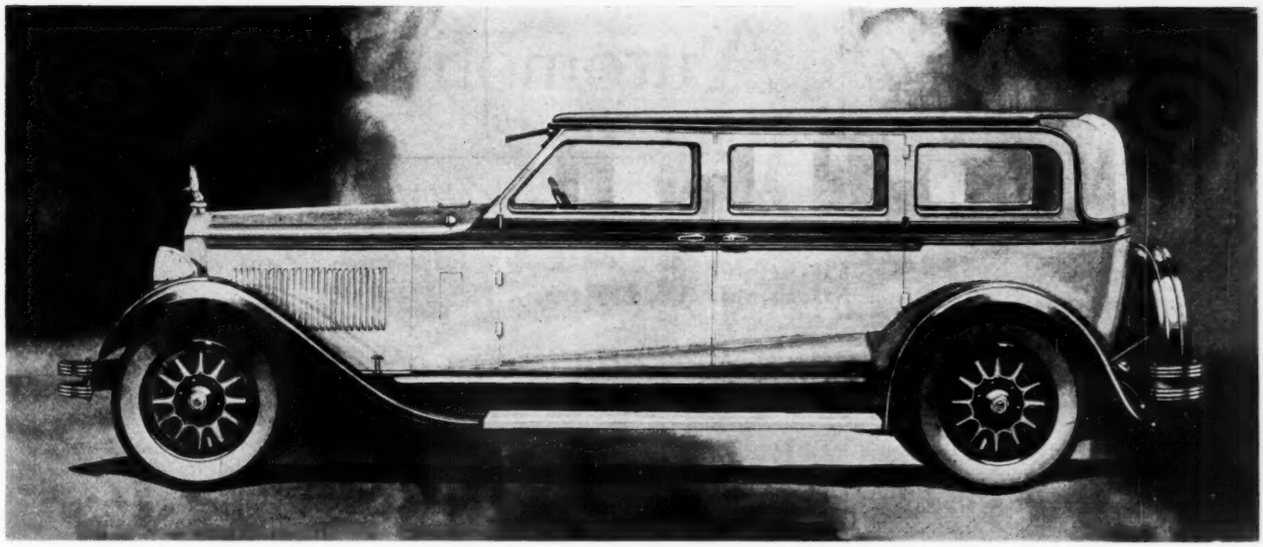
"The dimensions of the island are determined by the requirements of the landing platform for the airplanes, which must be at least 800 by 1300 ft., and preferably longer. The islands would have to carry a number of sheds for a reserve plane, station plane (weather service), repair work on the trans-Atlantic planes, etc., as well as buildings for the management, for the weather and radio service, and the physician, rooms for spare parts, engine supplies, etc., besides a pretentious hotel in which the passengers could rest during the landing periods and put up over night if necessary."

These hotels, he thinks, would soon enjoy a good patronage from people in need of recreation. Persons suffering from hay fever, consumption, etc., would be glad to spend days and even weeks at these hotels in the pure air. It must be considered that a trip to an island midway between Europe and America, would require no longer than the railway trip from Berlin to Frankfort-on-Main. Dr. Eisenlohr thinks that the operation of the hotel alone would pay for the islands, and the air transport enterprise would not be burdened by it.

All that can be said concerning the technical arrangements of such an island is that it must be a first class flying station, with giant searchlights, weather vanes, etc. In addition the islands must shift with the winds, so that the longitudinal axis always lies in the direction of the wind. Whether this could be secured automatically by anchoring of the islands or would require special mechanical equipment would have to be made the subject of a special study. The former method could be used in fair weather, the latter in storms, and provisions should be made for both, therefore.



Sketch of proposed floating landing station for the Atlantic Ocean



New Velie 88 five-passenger, four-door sedan

Velie Enters *Eight*-Cylinder Field With Worm Drive Model

Lycoming engine used in 125-in. wheelbase chassis. Sedans list at $2,095. Low overall height a feature

A NEW line of Velie eights with worm gear final drive, listing at $2,095, has been announced by the Velie Motor Corp., of Moline, Ill. The wheelbase is 125 in. and the use of the worm gear, coupled with a frame kick-up of 2½ in., has resulted in an overall height of only 67 in.

Two models comprise the new series, known as the 88, both five-passenger, four-door sedans, one with a sloping windshield, the other with a straight front windshield. The appearance of the new cars is much like that of the royal and special sedans on the Model 60 chassis.

The powerplant is a Lycoming eight-in-line engine of 3¼ in. bore and 4½in. stroke. The three-speed transmission was developed by the Mechanics Machine Co. of Rockford, Ill. A Borg & Beck 11-in. flexible disk, single plate clutch is used, and the drive to the rear axle assembly is through two Cleveland self-oiling universal joints and a propeller shaft of the tubular type. The worm-type rear drive also is of Cleveland make. Timken bearings are used throughout the rear axle assembly. Rear axle shafts are drop forged and heat treated.

Semi-elliptic springs are used all-around, 38 by 2 in. in front and 55 by 2 in. in the rear. Spring shackles are of the rubber bushing type, which need no lubrication. Four-wheel Lockheed hydraulic internal brakes are fitted, the brake drums being 14 in. in diameter.

The pressed steel frame is made of extra-heavy, three-gusseted stock and has a double drop. There are three-gusseted cross members in addition to a rear cross plate 16 in. wide. The front axle is equipped with Timken roller bearings in the wheels and steering spindles. Twenty-inch Bell spoke-type wheels with steel felloes are used. Tires are 32 x 6.20 in., full balloon type.

A two-unit Delco-Remy electric system with a Prest-O-Lite battery is employed in this model, which is equipped with an Electro ignition lock. The steering gear is a Ross cam and lever type.

Tests have shown the new car to be capable of accelerating from 5 to 25 m.p.h. in 6.51 seconds, from 10 to 30 in 6.6 seconds, from 10 to 40 in 10.38 seconds, from 10 to 50 in. 15.26 seconds, and from 10 to 60 in 22.52 seconds.

Exterior finish for both models is in high-lustre, two-tone lacquer, the shades being optional.

Chase Velmo mohair is used for the upholstery, with wainscoting and garnish molding in natural walnut finish. A dome light with side control is fitted, and Butler satin-finish remote control door locks, with the lever in the center of the door, are standard on both models. Silk window curtains, silk assist cord, arm rests, robe rail, foot hassocks and vainty case complete the interior fittings. The instrument board is of oxidized metal, with the instruments under glass and indirectly lighted. Headlight control is at the center of the steering wheel.

Bodies are of the composite type. Selected ash and oak are used throughout, and all joints are glued, screwed and braced.

Factory equipment includes front and rear snubbers, an automatic windshield wiper, an automatic stop light, Ilco-Ryan headlights, a one-piece ventilating windshield, a rear vision mirror, front and rear bumpers, an extra tire, tube and cover, a gasoline strainer, an oil filter, an Electro ignition lock, a radiator emblem and a built-in vanity case.

Automotive Industries
November 5, 1927

Buying *of* Automotive Supplies *Spread* Over *Many Wholesale*

Pennsylvania survey shows 243 car dealers, garages, etc., buy their merchandise in 59 cities.

By David Beecroft

IN the first instalment of this article, which appeared on Oct. 22, it was pointed out that the 243 motor vehicle dealers, garages, repair shops and service stations in the 14 counties in Pennsylvania included in the trade-buying survey, buy their merchandise in 59 different cities. This is a good indication of what may be expected when the buying of these 243 is divided up among the wholesalers. It is also divided among car manufacturers, car distributors and among a certain number of manufacturers of shop equipment and hand tools who have a direct-from-factory-to-dealer sales policy.

The buying of hand tools is more divided than any other one group in that such are bought from 101 different wholesalers:

Chassis replacements parts bought from 85 different wholesalers.

Electric repair parts bought from 92 different wholesalers.

Brake lining bought from 64 different wholesalers.

Accessories bought from 94 different wholesalers.

Hand tools bought from 101 different wholesalers.

Shop equipment bought from 73 different wholesalers.

A further analysis of the buying accounts of each group shows that no one group of wholesalers (that is, four or five concerns) controls the business, but rather there are generally 12 or more wholesalers in each group who have one-half of the buying accounts. For example, in the buying of accessories, 17 wholesalers have one-half of the accounts and the remaining half of the buying accounts is divided among 77 different wholesalers. The following figures show how many wholesalers control one-half of the accounts and how many the other half:

Classification	Control ½ Accts.	Control Other Half Accts.
Chassis replacement parts	13	72
Electric repair parts	24	68
Brake lining	12	52
Accessories	17	77
Tools	16	85
Shop equipment	13	60

A great many of the smaller wholesale sources that make up the list handling the "other half" of the accounts, are found in the smaller cities and towns where they are serving a local circle of retail outlets; but there are also not a few of these wholesalers located in first-line distributing centers. There are also several of them located in cities outside of Pennsylvania, such as Buffalo, New York, Jamestown, Chicago, Canton, Hagerstown, Wheeling, Cleveland, Detroit, Baltimore, Richmond, Va., Milwaukee, etc.

A permissible inference, in connection with the great number of wholesalers among which the "other half" of the accounts are divided, is that a number of wholesalers in first and second-line cities are covering parts at least of these 14 counties as a fringe territory and apparently securing but a very limited amount of business in them. It would be misleading for the manufacturer to conclude that the wholesalers who have the "other half" of the accounts are newcomers in the field. It is true that a percentage of them are such, but it is further true that a very measurable percentage of them are old established wholesalers located at considerable distance from these counties.

A graphic picture as to how the first half or the accounts in each group are controlled by a smaller number of wholesalers is shown herewith, the name of the wholesaler being left out but the town name and also the number of accounts given:

1. Replacement Parts—The 13 wholesalers enjoying one-half of the buying accounts in this group follow:

Wholesaler	A	Allentown	28	Accounts
"	A	Uniontown	17	"
"	A	Easton	14	"
"	A	Pittsburgh	14	"
"	A	Butler	11	"
"	B	Allentown	10	"
"	A	Pottsville	12	"
"	B	Pittsburgh	9	"
"	A	Greenville	9	"
"	A	Oil City	8	"
"	A	Youngstown	8	"
"	B	Pottsville	8	"
"	A	Reading	7	"

2. Starting, Lighting and Ignition Parts—The 24 wholesalers enjoying one-half of the buying accounts in this group are:

Wholesaler	A	Pittsburgh	14	Accounts
"	A	Allentown	6	"
"	A	New York	6	"
"	A	Williamsport	5	"
"	B	New York	5	"
"	A	Easton	4	"

by Retailers Centers

"	C	New York	4	"
"	A	Uniontown	4	"
"	A	Bethlehem	3	"
"	A	Butler	3	"
"	A	York	3	"
"	B	Allentown	3	"
"	B	Easton	3	"
"	C	Allentown	3	"
"	A	Scranton	3	"
"	D	Allentown	2	"
"	A	Philadelphia	2	"
"	A	Erie	2	"
"	D	New York	2	"
"	B	Butler	2	"
"	E	Allentown	2	"
"	B	Erie	2	"
"	B	Pittsburgh	2	"
"	A	Baltimore, Md.	2	"
"	A	Franklin	2	"

3. Brake Lining—The 12 wholesalers who enjoy one-half of the brake lining accounts are located in cities as follows:

Wholesaler	A	Pittsburgh	17	Accounts
"	A	Harrisburg	10	"
"	A	Allentown	9	"
"	A	Easton	9	"
"	A	Uniontown	8	"
"	A	Oil City	8	"
"	B	Pittsburgh	8	"
"	B	Uniontown	7	"
"	B	Allentown	7	"
"	C	Allentown	7	"
"	A	Greenville	7	"
"	A	Reading	5	"

4. Accessories—The 17 wholesalers who enjoy one-half of the accessory buying accounts are located as follows:

Wholesaler	A	Pittsburgh	24	Accounts
"	B	Pittsburgh	20	"
"	A	Allentown	19	"
"	A	Harrisburg	17	"
"	B	Allentown	15	"
"	C	Pittsburgh	12	"
"	C	Allentown	12	"
"	A	Uniontown	11	"
"	A	Greenville	11	"
"	A	Oil City	11	"
"	A	Easton	10	"
"	A	Scranton	9	"
"	D	Allentown	9	"
"	A	Reading	8	"
"	B	Harrisburg	8	"
"	A	Philadelphia	8	"
"	E	Allentown	7	"

5. Tools—The 16 wholesalers who enjoy one-half of the hand tool buying accounts are in the following cities:

THIS is the second and last part of Mr. Beecroft's article on the results of a survey which was conducted recently in 14 Pennsylvania counties to discover buying habits of the automotive retailer in such major groups of automotive products as chassis replacement parts; repair parts for starting, lighting and ignition; brake lining; major accessory items; hand tools and small machine tools; shop equipment lines.

Among other things, the survey showed a surprising amount of wholesale buying in third and fourth-line cities as compared with the amount of buying in first and second-line cities.

This is of prime interest to all manufacturers of automotive supplies, in that it shows the necessity of cultivating outlets in the smaller cities in order to get complete distribution under present trade-buying conditions.

Wholesaler	A	Pittsburgh	20	Accounts
"	B	Pittsburgh	18	"
"	A	Allentown	14	"
"	B	Allentown	13	"
"	C	Allentown	13	"
"	A	Uniontown	12	"
"	A	Greenville	11	"
"	A	Harrisburg	10	"
"	A	Easton	9	"
"	C	Pittsburgh	9	"
"	A	Reading	8	"
"	A	Youngstown	8	"
"	B	Easton	7	"
"	D	Pittsburgh	7	"
"	A	Oil City	7	"
"	B	Youngstown	6	"

6. Shop Equipment—The 13 wholesalers controlling one-half of the accounts are located as follows:

Wholesaler	A	Pittsburgh	24	Accounts
"	B	Pittsburgh	18	"
"	A	Allentown	17	"
"	A	Harrisburg	13	"
"	A	Reading	12	"
"	A	Uniontown	10	"
"	B	Allentown	10	"
"	A	Buffalo	10	"
"	A	Oil City	9	"
"	A	Youngstown	9	"
"	C	Pittsburgh	7	"
"	C	Allentown	7	"
"	D	Pittsburgh	7	"

Space will not permit an analysis of the wholesalers that enjoy the second half of the buying accounts in each of these six groups. It is significant that 48 per cent of the motor vehicles are in places of 5000 population or less and that the second half of the buying accounts are divided among so many different wholesalers, the majority located in small towns and others located in large cities lying outside of Pennsylvania.

There is a very definite tendency on the part of motor vehicle dealers, garages, repair shops and serv-

ice stations to buy as much as possible of any one line of products from one wholesaler, rather than dividing the business among two or three.

For example, 81 per cent of these retailers purchase their brake lining from one wholesaler each. There are fewer, 16 per cent, who purchase brake lining from two wholesalers each, and a scattered few who buy from three wholesalers each.

Here is a table showing the percentages of retailers who purchase different groups of products from one, two or three wholesalers each:

	One	Two	Three
Repair parts	55%	26%	13%
El. repair parts	77%	16%	..
Brake lining	81%	16%	..
Accessories	47%	32%	14%
Tools	65%	21%	8%
Shop equipment	64%	26%	5%

Some indication of the volume of near-home buying has been given in connection with showing the number of buyers in different groups of cities, such as first-line, second-line, third-line and fourth-line, with the average buying distance for each of these classifications.

More convincing facts on near-home buying are given when the number of accounts that do their buying within 50 miles from home is given. The following figures show the percentage of buying accounts for each automotive group within the 50-mile radius:

Chassis replacement parts	87.4%
Brake lining	82.1%
Accessories	73.6%
Shop equipment	72.6%
Hand tools	68.5%
Elect. repair parts	67.2%

The percentage of 68.5 buying hand tools within 50 miles is misleading. This also applies to 67.2 per cent buying starting, lighting and ignition within 50 miles. Here are the reasons:

In the hand tool field there is a great deal of buying direct from manufacturers, particularly with Chevrolet and Ford dealers who buy direct from a Detroit factory. There are others that buy direct from factories in Ohio, Illinois, Wisconsin and Minnesota. This direct-from-the-factory buying should not be included, if a definite yardstick is to be placed on the actual amount of hand tool buying done within the 50-mile zone. It is probable that if these direct-from-factory buying accounts were left out of the calculations it would show that upward of 90 per cent of the hand tool buying is done within the 50-mile radius.

In buying electric repair parts for starting, lighting and ignition the unbalancing factor is that so many retailers are buying these parts from wholesalers in New York City who are covering Pennsylvania intensively. Next to Pittsburgh, New York City has the most buying accounts for electric repair parts from these 14 counties. This business, of course, goes through wholesalers and rightfully belongs in the calculation and therefore explains why the percentage of buying within the 50-mile zone is only 67.2 per cent. This New York situation is more or less of a reflection on the merchandising methods of several of the local wholesalers handling these lines.

A more detailed analysis of the volume of buying at distances of less than 50 miles for each of the six groups is given herewith:

Replacement Parts

27	retailers,	or	11%	buy	locally				
67	"	"	35.5%	buy	at	an	average	of	10.6 miles
46	"	"	18.8%	"	"	"	"	"	23.2 "
54	"	"	22.1%	"	"	"	"	"	39.1 "

Repair Parts for Starting, Lighting and Ignition

21	retailers,	or	12%	buy	locally				
28	retailers,	or	16.7%	buy	at	an	average	of	8.7 miles
31	"	"	18.4%	"	"	"	"	"	23 "
33	"	"	19.6%	"	"	"	"	"	40.8 "

Brake Lining

26	retailers,	or	14.6%	buy	locally				
45	"	"	25.3%	buy	at	an	average	of	9.8 miles
37	"	"	20.8%	"	"	"	"	"	23.2 "
38	"	"	21.4%	"	"	"	"	"	41.3 "
146	"	"	82.1%	"	"	"	"	"	19.6 "
21	"	"	11.8%	"	"	"	"	"	59.2 "
1	"	"	.5%	"	"	"	"	"	80 "
10	"	"	5.6%	"	"	"	"	"	130.5 "

6.5%	buy	locally	or	in	their	home	town	
17.6%	buy	at	an	average	of	10.3	miles	from home
18.9%	"	"	"	"	"	24.5	"	" "
30.6%	"	"	"	"	"	40	"	" "
18.2%	"	"	"	"	"	60.7	"	" "
2.3%	"	"	"	"	"	80.1	"	" "
5.9%	"	"	"	"	"	177.5	"	" "

Tools

19	retailers,	or	68%	buy	locally				
57	retailers,	or	28.5%	buy	at	an	average	of	10.3 miles
49	"	"	17.6%	"	"	"	"	"	23.1 "
66	"	"	23.6%	"	"	"	"	"	40 "

Shop Equipment

11	retailers,	or	4.5%	buy	locally				
45	"	"	18.7%	buy	at	an	average	of	10.8 miles
47	"	"	19.5%	"	"	"	"	"	24.1 "
72	"	"	29.9%	"	"	"	"	"	41.6 "

The status of the small town in the 14 counties in Pennsylvania is duly emphasized by the fact that 74 per cent of the cities, towns and villages from which the 243 replies in this study were received are places of 5000 population or less—specific evidence of the extent of automotive business in small places.

Here is an analysis of the population of 108 different cities, towns, villages and cross-roads in these counties from which the 243 replies were received:

1,000 population or less	44	places
1,001 to 2,500	25	"
2,501 to 5,000	11	"
5,001 to 10,000	12	"
10,001 to 25,000	14	"
25,001 or more	2	"

While 48 per cent of all the motor vehicles in the United States are in places of 5000 population or less and in the farm areas adjacent thereto, it is most significant that 48 per cent of the car dealers, garages, repair shops and service stations in the 14 counties on which this study is based, are in places of 5000 population or less. This is good evidence of how well these 14 counties can be taken as a pretty accurate cross section, not merely for the State of Pennsylvania, but for the country.

Just Among Ourselves

Dealer and Manufacturer Must Pull Together

DEALER and manufacturer relationships bid fair to assume an even more vital role in determining the efficiency and effectiveness of automotive merchandising next year. With both elements of the industry striving fundamentally for the same objective, numerous occasions arise, obviously, when the immediate interests of one group do not exactly coincide with the immediate interests of the other. Such current differences always have been and always will be a part of the automotive marketing picture. Active, intelligent and sincere attempts to iron out such situations so that both parties at interest get a practical as well as a theoretical square deal will permit quicker progress to the ultimately common goal than any amount of mutual recrimination and calling of names. Often the tone, just as much as the subject matter of a discussion of any of these current differences, will have a strong bearing on the outcome. Particularly is this psychological aspect important from now on when the automotive industry as a whole must array itself against other industries in a fight for a greater share of the consumer's dollar. Unity in spirit may rapidly become essential as well as desirable.

* * *

Opportunity for Teamwork in Moving Used Cars

SOMETIMES these current situations will involve unfavorable conditions, a share of which must be borne by every phase of the industry. Keeping in mind the necessities of the new competition of industry with industry, manufacturers will recognize the soundness of showing a willingness to assume a share of the grief in such instances, even while logically expecting the dealers to work out much of the trouble on their own account. Probably in no question so much as in that of used cars is this necessity for mutual constructiveness so necessary at the moment. Car makers in the last two years have evidenced clearly their understanding of the fact that the used car is partly their problem as well as the dealers'. Some makers have helped in various organized ways to aid the dealer in moving his used vehicles. And there has been an increasing tendency to realize and practice the one form of help that is most fundamental and most useful—that is, by refraining from forcing new cars on retailers. Nevertheless this practice is far from being wiped out. Until it is, the manufacturing end of the business as a whole cannot be said to have assumed entirely its fair share of the used car problem.

* * *

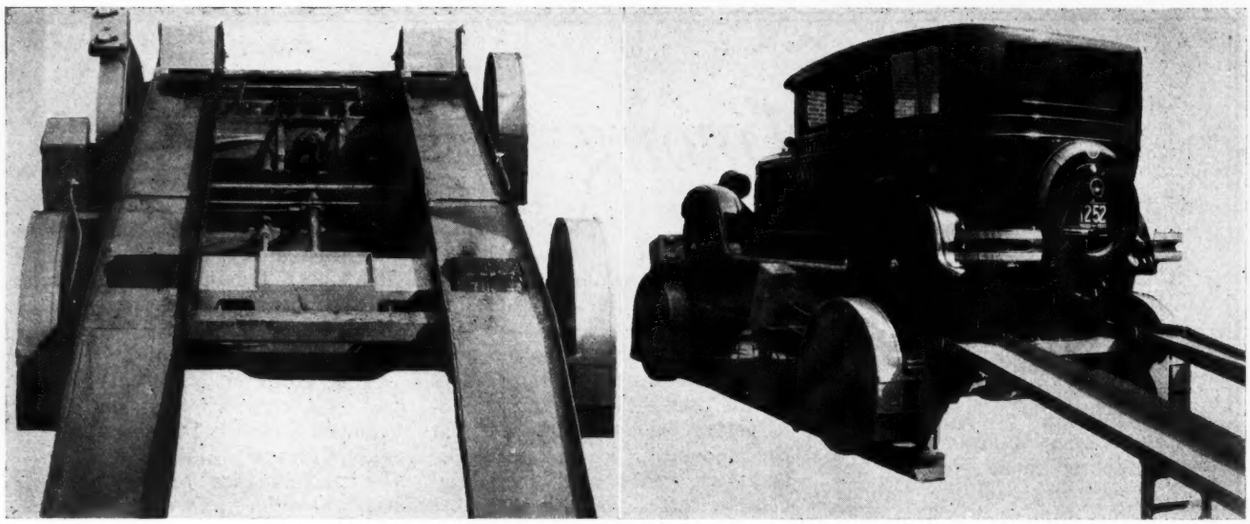
Knowledge is Not Understanding

THOSE manifestations in a man's work which turn out to be of the most permanent significance almost always will be found to be a result of the application of abilities or qualities which have become an inherent and integral part of his being; results obtained from such attributes as are merely hung on to his personality by some sort of psychological hooks, as it were, rarely amount to much. There is a profound and fundamental difference between knowledge and understanding, as Count Keyserling keeps pointing out. In different terms, perhaps, but none the less definitely, automotive managements are recognizing these facts in their selection and adaptation of various men for executive positions—and the industry is benefiting as a result. Max Mason, the very business-like president of Chicago University, emphasized this same thought in a slightly different way while talking to a convention of the Associated Business Papers recently. "Cultural values illuminate the performance of our daily life," he said, "and culture is a by-product of sane and sensible living."

* * *

Many Elements Influence Mergers

MERGER negotiations in the passenger car field seem to be continuing behind closed doors but still nothing seems to have happened portenting immediate announcements of anything startling. So many possible permutations and combinations have already been suggested formally or informally within the industry that nothing which might emerge could be considered entirely in the nature of a surprise. While the text books and the economists continue to discuss automotive combinations in terms of buying power and efficiency of operation, many other factors are starting and stopping merger negotiations. The desire of a group of stockholders to get out of a company, the desire of a banking group to find a good place for investment of funds or for floating of stock at a profit, the personal initiative of one executive or the willingness to retire of another, the desire of one company to control sources of supply or of another to control markets for its products—all these and many other factors of a more or less immediate character are going to be just as vital in determining whether or not mergers are made as any long swing calculations about economic tendencies.—N. G. S.



Figs. 1 and 2. Two views of the Brake Synchrometer

Brake-Testing Machine *Simulates* Road *Operating* Conditions

"Synchrometer" automatically makes record of decelerating characteristics of each wheel, plotting the speed for each foot of travel from time brake is applied to complete rest.

A BRAKE-TESTING apparatus based on a new principle has been placed on the market by the Brake Synchrometer Co., 87 Lincoln St., Boston, Mass. The inventor of the apparatus, Charles F. Smith, head of the Automotive Division of the Edison Electric Illuminating Co. of Boston, contends that for best results a brake-testing machine must duplicate road operating conditions, and he has designed his machine accordingly.

The Brake Synchrometer, shown in Figs. 1 and 2 herewith, automatically makes a record of the decelerating characteristics of each wheel, plotting the rate of speed for each foot of travel from brake application to rest. This is accomplished with an electric attachment that during a test automatically passes a tape under four electrodes (one for each wheel), puncturing the tape at intervals.

This tape is passed under the electrodes of the recorder at the rate of 6 in. per second. The space between any two adjacent dots represents one foot of travel. The record or graph is interpreted by means of a small instrument which, when its points are placed so as to encompass one, three, or five spaces, directly translates the values into terms of miles per hour, dependent on the number of spaces being measured, the instrument having three scales.

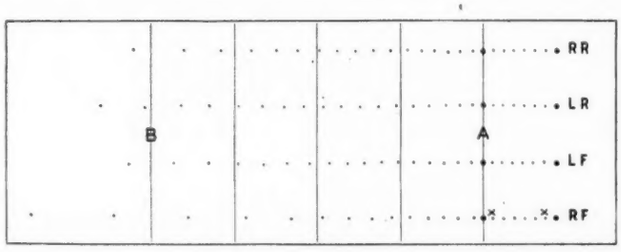


Fig. 3. Actual record (reduced in size) from Brake Synchrometer

The Brake Synchrometer's graph indicates the speed of the vehicle before the brakes were applied, its stopping distance and its average speed for each foot of travel throughout the deceleration period. This also applies to the deceleration of each wheel. Graphs are produced at the rate of four per minute.

The Brake Synchrometer consists mainly of four flywheels, or rotors, suitably mounted in bearings and capable of being positively engaged or disconnected from each other. Each of the wheels of the vehicle under test rests upon a drum directly connected to one of these rotors. The flywheels are engaged with each other and the vehicle engine and gear shift are operated as on the road, the flywheels being speeded up to a point where they possess the same kinetic energy that the vehicle under test possesses when operated on the road at a selected speed.

The flywheels of the Synchrometer illustrated have been designed arbitrarily to correspond to a vehicle weighing 3500 lb. That is, in testing a vehicle of that weight, the rotors are run at the speed it is desired to test the vehicle brakes. Heavier machines are run at a slightly higher speed and

machines weighing less than 3500 lb. are run correspondingly slower. In each case the total energy of the flywheels is the same as that of the vehicle at a selected speed.

When the desired speed is reached, the brakes are applied. Simultaneously and automatically the rotors

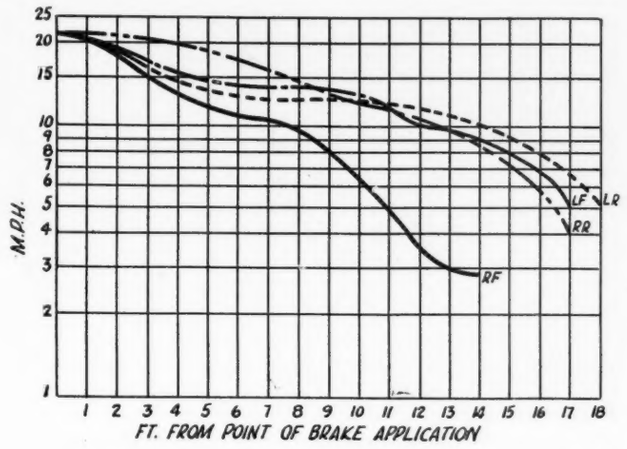


Fig. 4. Speed-distance graph drawn from records of Brake Synchrometer

are disconnected from each other and the recording instruments are set in motion, registering independently the number of feet and inches each wheel travels before it comes to rest.

A fac-simile electric graph of a test made on a medium weight six-cylinder sedan is shown in Fig. 3. This shows that the left front wheel traveled 17 ft. after the brakes were applied, while the right front wheel covered 14 ft., yet the right front wheel was in motion one-quarter second longer than the left. The graph also shows that the decelerating rate from start to finish of the right front wheel was more nearly constant than that of the opposite wheel, and that there was but little change in the decelerating rate of the left front wheel until it had traveled 10 ft., at which point it was moving at 12 m.p.h.; deceleration then occurred rapidly, the wheel partially locking and skidding the balance of its travel.

Referring to the graph (using the instrument mentioned), we find, by placing its points at dots X X, that the speed of the vehicle was 21.5 m.p.h. when the brakes were applied on line A. Line B indicates the lapse of one second's time, and intervening lines mark one-quarter second periods. As each space between dots represents one foot of road travel, by measuring any one of these spaces with the instrument, the average speed for that particular foot of travel is read directly in miles per hour. Distance-speed curves can be plotted on semi-logarithmic cross-section paper. Fig. 4 gives the curves of the test tape shown in Fig. 3.

Many factors of brake action became apparent through a study of the Brake Synchrometer's graphs and curves, including the stopping distance of the vehicle, the percentage of retarding effort of each wheel (equalization), brake drag or other undue friction, brake lining characterstics, and the effects of heat and of the turning couple. Acceleration tests also can be made.

For use in service stations, garages, etc., where simple brake tests, equalization and brake drag determinations are desired, the Brake Synchrometer is equipped with odometers, one for each wheel, located on instrument boards that automatically record in feet and inches the travel of each wheel before it comes to rest after its brake was applied, as well as the stopping distance of the vehicle on the road.

The Brake Synchrometer shown is capable of testing vehicles with two or four-wheel brakes, weighing up to 7500 lb. Only one man is required to operate it.

Graham Half-Ton Truck

THE introduction of a ½-ton panel delivery model is announced by Graham Brothers. The latest model which rounds out the Graham Brothers truck and bus line lists at $770 complete with body. It has an allowable speed of 40 m.p.h., 5½-ft. loading space and has full equipment including automatic windshield wiper, passenger car type instrument board, cowl ventilator, rear view mirror mounted on tire carrier at left front fender, combination tail and stop light and front bumper.

The chassis, while designed by Graham Brothers, has been developed on the basis of the Dodge Brothers four-cylinder line with a view to making servicing operations as identical as possible with those on the Dodge Four, major units being practically interchangeable. The four-cylinder engine with bore and stroke of 3⅞ by 4½ in. is identical with that used in the Graham Brothers ¾-ton truck described in the Aug. 20 issue of *Automotive Industries*. The three-speed transmission and single-plate dry clutch are assembled in unit with the engine. Wheelbase is 108 in. Tires are 29 x 5.00 heavy-duty six-ply balloon, front and rear, on wood wheels. Road clearance under the semi-floating bevel gear 3.769 to 1 reduction rear axle is 8 in. A worm and sector steering gear is standard, with a 38½-ft. turning circle diameter.

Body framework is of hardwood cross sills, uprights and top ribs. Body sides are constructed of composition board covered with sheet metal with padding in between to eliminate rumble. A single full width door with two rear windows in the upper portion is provided in the rear.

This ½-ton delivery, listing at $770, has been added to the Graham Brothers truck line

Weight Reduction de Lavaud's Chief Aim *in* Design *of* New Car

Claim is made that sedan with wheelbase of 128 in. and with four passengers and full equipment will weigh not more than 2200 lb. Many unique features.

By W. F. Bradley

IT is with the object of demonstrating his special torque converter, which has now been before the public for three or four years, that Sensaud de Lavaud has produced a complete automobile embodying many unusual ideas. The claim is made that the torque converter is now mechanically perfect, and indeed there are so many other special features on de Lavaud's car that the special transmission can no longer be considered the outstanding feature.

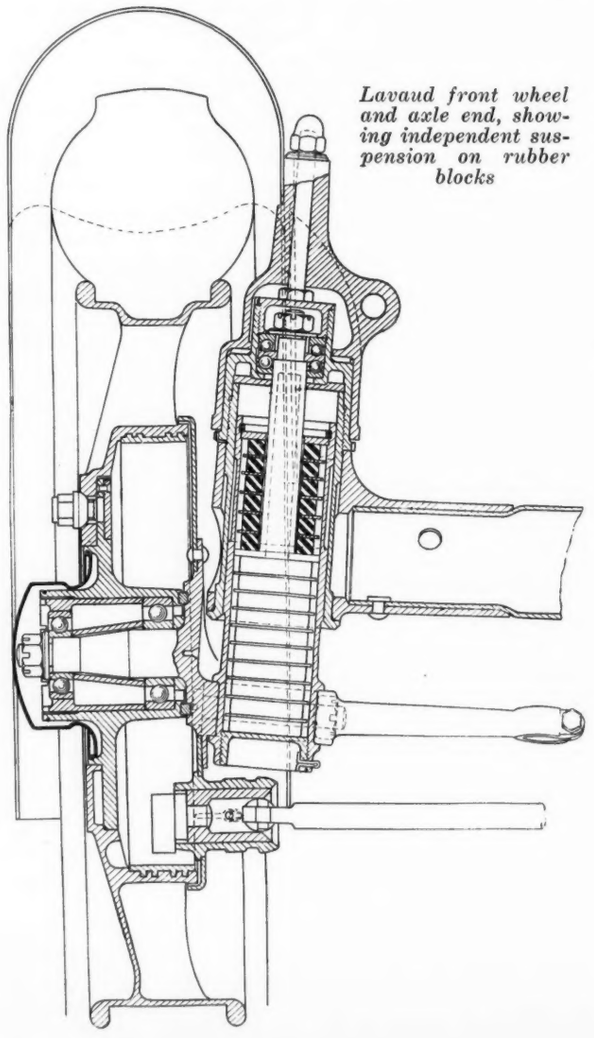
The car was exhibited at the recent Paris automobile salon and was referred to briefly in my articles dealing with that event in *Automotive Industries* of Oct. 8 and Oct. 22. Other views than those shown here also were presented with the previous articles.

Important in the changes made in the torque converter is the adoption of a new type of free wheel, replacing the self-jamming cams used in the past. The new free wheel mechanism consists of a series of balls which lock by rising up in a suitably profiled groove. It is claimed that with correct heat treatment of the metals this free wheel device gives every satisfaction, showing a high degree of efficiency and not requiring any special lubricant. While the gear is claimed to be completely automatic under all conditions, de Lavaud has added a hand control to the swash plate to secure greater variations required in very hilly and level country.

In adapting this transmission to a chassis of his own design de Lavaud has been principally interested in weight reduction. It is maintained that with a sedan having a wheelbase of 128 in. the weight with four average passengers, tanks filled and full equipment for the road will be reduced to 2200 lb. The first chassis exceeds this weight, but reductions can be made.

A chassis frame in one casting of Alpax metal (aluminum silicon alloy) is the distinguishing feature of the de Lavaud automobile. The frame is essentially rigid and carries with it the engine bearers, a tunnel for the driveshaft, wells for the passengers' feet, the full width platform on which the cushions are set, a locker at the rear receiving the gasoline tank and the storage battery, and it is further stiffened by an Alpax dashboard bolted to the sides of the frame and to the head of the propeller shaft tunnel. The average height of the frame is nearly 8 in., while the thickness varies from 6 to 10 mm. Projecting from the front is a cast steel trunnion, having a diameter of 8½ in. and a depth of about 3½ in., which has been set in the mold and has the Alpax metal cast around it. This constitutes the trunnion mounting for the front axlxe.

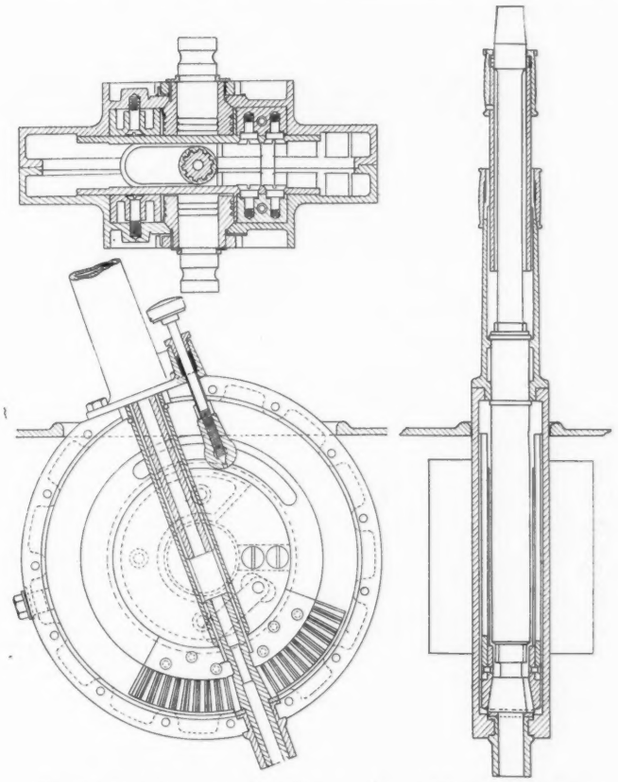
The gasoline tank is merely wedged in the rear locker and can be withdrawn by removing the wedges. The battery box is secured in the same way in another compartment of this locker. The hinged door on the rear of the locker has the spare wheel carrier cast with it. The top of the locker receives the luggage trunk. With this rigid frame construction and the whole of the load carried directly on the frame, an exceptionally light body is possible, for it has no other function than to give protection against wind and rain. It is claimed



Lavaud front wheel and axle end, showing independent suspension on rubber blocks

that the first fabric leather four-passenger close-coupled body weighs 285 lb.

The chassis has three-point suspension with the use of rubber blocks in place of laminated springs. The



Sectional views of steering gear combined with hydraulic anti-shimmy mechanism

front axle is produced on the lines of the ordinary banjo-type rear axle housing, of two steel pressings welded together, and is pivoted on the trunnion projecting from the front of the chassis. The mounting at this point is by a special rubber bushing, with disks of Ferodo for the lateral thrust. The hollow trunnion receives the electric generator and starting motor and has its end covered by an aluminum plate. Big diameter vertical tubes are welded to each extremity of the axle, these receiving the steering pivots and the series of super-imposed circular rubber blocks assuring suspension. The rubber has been specially produced for this class of work by an English firm and is claimed to have a life exceeding that of the mechanical parts of the car.

At the rear the same type of rubber block suspension is used, the guides for the rubber blocks consisting of two vertical cast steel tubes screwed into the frame. These guides come within the rear corners of the body, so that externally no system of suspension is visible. To avoid lateral displacement of the axle in relation to the chassis, there is a porjection on the rear of the axle casing received in guides on the under surface of the chassis. The torque converted is contained in the rear axle housing, which has a torque tube combined with it and is forked to the under side of the chassis. A clutch is fitted, but as there are no gear shifts and the car will throttle down to a couple of miles an hour, both on the level and on gradients, the clutch is never made use of except when a complete stop is necessary.

Dual steering is used. This consists of a bevel pinion on the steering column engaging with a left and right-hand bevel sector screwed to circular disks contained within an aluminum housing mounted on the inclined forward face of the dashboard. The horizontal shafts of these disks turn in opposite directions on the rotation of the steering wheel and each one has mounted on its extremity a lever from which connection is made by means of vertical links to a bell crank on the frames. From the lower arm of the bell crank there is connection by a rod with the usual ball and socket joint to the steering arm secured to the steering pivot. The steering pivot being of circular section, the arms resemble an engine connecting rod, with a split bearing, which is bolted around the pivot by the two bolts. Consisting of bevel gearing, the steering is completely reversible, but combined with it is a hydraulic damper composed of the disks on which the sectors are screwed, operating within the steering gear housing. By means of a milled screw on the steering column, the resistance of the flow of oil from one chamber to the other can be adjusted while the car is in motion, thus providing either a light or stiff steering according to road conditions encountered. The steering column is telescopic and instantly adjustable for length, while the steering gear box being circular, it can easily be rotated to vary the inclination of the column.

Brakes Adjusted from Dash

Bendix three-shoe brakes are fitted. The feature of the brake installation is that all the adjustment is on the forward face of the dashboard, under the hood. Carried in bearings on a ledge of the dashboard is a horizontal shaft on which are mounted the levers for the front and rear brakes and for the clutch. Practically all the brake and clutch levers are of duralumin. They have thumb screw adjustment, all placed at a height higher than the top of the engine, thus permitting play to be taken up by unhinging the top of the hood. The hand brake is operated by a rod with a handle going through the dashboard.

The engine used by de Lavaud is the least outstanding feature of the chassis. It is a six-cylinder of 70 by 100 mm. bore and stroke having a detachable head in Alpax metal. With a view to weight reduction the cast iron cylinders and crankcase will later be replaced by an Alpax casting. The engine has vapor cooling and is the only one with this method of cooling in the Paris show. Attachment to the chassis is by three points, two at the rear and one in front, with rubber-bushed split bearings. The forward engine bearing is of exceptional diameter. After unscrewing the six nuts on the three-bearing caps and disconnecting the forward universal joint, the engine can be lifted directly out of the frame.

Each front fender, which is of aluminum, stiffened by a central rib, is mounted on the steering pivot, being held down by a single nut and prevented from turning by a vertical finger. The inner flange of the fender carries the support for the headlight which, in addition to turning with the wheel, can be adjusted in both a horizontal and a vertical plane.

Cast Alpax wheels are used.

The chassis has a wheelbase of 128 in., with a track of 55 in. The first models to be produced have a fabric leather close-coupled four-seater body, with a total height of 61½ in. and an internal height from the top of the chassis frame to the roof of 45 in. The height from the ground to the top of the frame, this constituting the platform on which the seat is laid, is 17½ in., and the depth of the wells for the passengers' feet is just over 6 in.; total internal height is therefore 51 in. with a total external height of 61½ in.

In *the* Realm *of* Metallurgy—

Refinements in manufacture and design of metallographic equipment are announced by Bausch & Lomb

REFINEMENTS in the manufacture and design of its metallographic equipment which are said to do away with all possibility of vibration or change of focus which might destroy the efficiency of the apparatus in operation are announced by the Bausch & Lomb Optical Co.

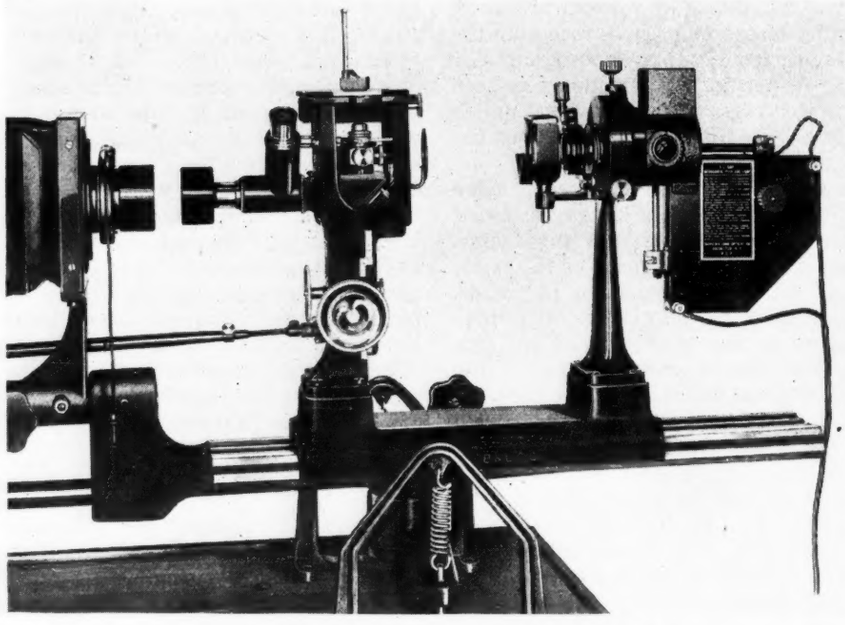
The refinement is a result of the demand for closer control of every element and operation that goes into the production of modern metal work.

In considering the Bausch & Lomb large metallographic equipment, its division into six primary elements is convenient. These elements are as follows:

1. The microscope with vertical illuminator, mechanical stage and prism equipment.
2. The illuminating system with condenser.
3. The camera.
4. The optical bed on which all of these parts are mounted.
5. The vibration or shock absorbers.
6. The supporting stand.

Previous to the appearance of the most recent model it has been customary to have all of the different parts adjustable relative to each other on the optical bed, both vertically and laterally; but there is no particular advantage in being able to throw the illuminating system out of alignment. The experienced workman at the factory, by means of collimators and gages, can accurately line up the illuminating and optical systems so that they will work at their highest efficiency, and then set them securely in position. The most critical technician can ask nothing more than a perfectly centered beam of light from the illuminant to the illuminator, and this is arrived at in the new model, which is called "permanently aligned."

It is claimed that this construction is the most important step forward in the photomicrography of metallurgical specimens since Le Chatelier introduced the inverted microscope, as it permits anyone to obtain satisfactory results regardless of the optical training or skill of the operator.



Bausch & Lomb large metallographic equipment

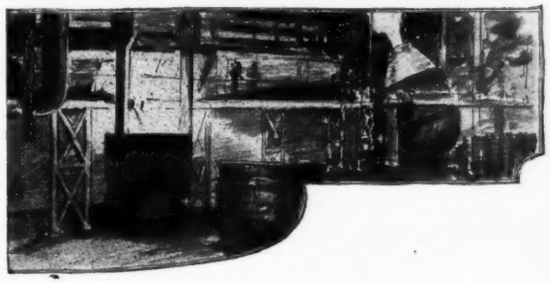
To secure the sharp definition necessary in such work, it is absolutely essential that there be no change of focus in the microscopic part of the apparatus during the photographic exposure because of expansion of the materials of the apparatus from the heat of the illuminant, nor vibration of any one part of the equipment relative to the other. If the sharpness of detail on the negative is to be of the order of 0.1 mm. at a magnification of 1000, neither the objective nor the specimen can have a relative lateral movements of as much as 0.0001 mm. At the same magnification, a change of distance between the objective and specimen of 0.01 mm. is sufficient to throw the image completely out of focus.

The new instrument has been so devised as to obviate vibration of the specimen relative to the objective. Furthermore, the fine adjustment is so arranged that it is required to move a weight of only 4 oz.

When an illuminant of high intensity is used, considerable heat is bound to be received by the vertical illuminator. For this reason, the objective is mounted independent of the vertical illuminator so that whatever heat reaches the latter and causes expansion will not change the distance between the specimen and the objective and as a consequence will not cause the image to go out of focus. A heat guard is provided to prevent any light other than the centered beam from reaching any part of the microscope.

The body of the microscope consists of a casting in which is mounted a stellite mirror which reflects the image received from the objective toward the photographic plate. Over this stellite mirror is

New Equipment *and* Materials



mounted a vertical illuminator box. The body, the eyepiece, stellite mirror and vertical illuminator are all in one rigid mounting. The entire stage inclosing the microscopic body is in a single casting.

On the microscope pillar, opposite the stellite mirror position is a strong, broad, fine adjustment slide on which the objective support moves. At the bottom of this slide is the fine adjusting mechanism which is required to raise and lower the objective and its mount only.

Photomicrograph of cast iron taken with new Bausch & Lomb metallographic equipment. (Specimen polished and etched 750 magnifications)

The screw which actuates the fine adjustment produces a vertical movement of 0.125 mm. per revolution. A large button may be brought into contact with a speed reducing shaft by moving a cam, thus providing a more sensitive, fine adjustment for use in focusing the image on the ground glass. One revolution of the rod in focusing on the ground glass provides a vertical movement on the objective of only 0.3125 mm.

The coarse adjustment consists of a broad, heavy slide on which the stage casting moves. This is actuated by a heavy rack and pinion controlled by a knurled head. The position of the slide may be fixed definitely and securely after an approximate focus is obtained by means of a lock actuated by a convenient screw.

The vertical illuminator consists of a square metal box mounted on the upper surface of the microscope base, with three openings. Facing the illuminant is a tube carrying the filter, iris diaphragm and condenser lens. At the top is an opening for the objective connector, while facing the operator is an opening carrying a shaft with knurled head at the outer end, which controls the clear glass reflector for directing the illuminating beam up through the objective.

The vertical illuminator is mounted on the microscope in a fixed position and is not thrown out of center with respect to the axis of the beam when the objective is focused on the specimen by means of the fine adjustment, as is the case with instruments in which the vertical illuminator and objective are both carried on the fine adjustment mechanism.

The illuminant and its accessories are supported on a rigid stand, that is, a unit with the pillar which supports the inverted microscope. The stand supports the illuminant in its adjustable centering mount, the condensing lenses, the iris diaphragm, a water cell and an auxiliary filter mount.

The illuminant regularly supplied with this outfit is the automatic feed arc lamp which must be used with a suitable rheostat for 110-volt current. Interchangeable in the same mounting is a 108-watt ribbon-filament Mazda lamp in a special housing for use in extended observations.

The large iris diaphragm is mounted in the optical axis of the instrument, just in front of the condensing lenses, and is so arranged as to make possible the illumination of the specimen by oblique or conical illumination, as well as direct illumination.

A new camera back has been developed to make the focusing of the image easier and more positive, and eliminate vibration in manipulation of the dark slide. It consists of a frame interposed between the rear bellows and the camera back proper, in which there is mounted a magnifier with a right-angle prism which faces toward the eyepiece of the miscroscope. To focus, it is necessary only to look in the magnifier and adjust the fine adjustment of the microscope until the image is in focus on the cross hairs. As these are located the same distance from the prism as the plane of the plate, the image must be in focus on that plane. The magnifier is mounted on a pivot so that it may be moved across the entire field.

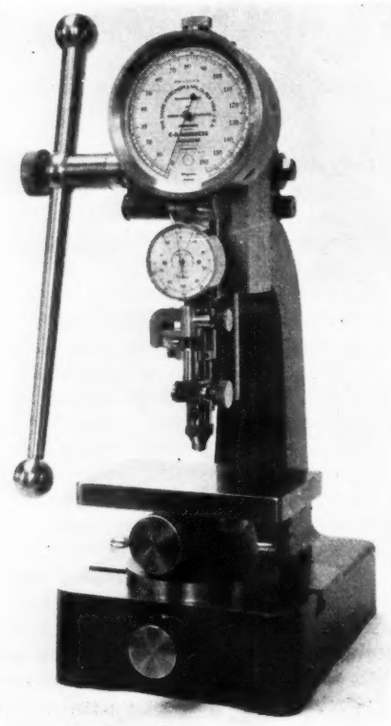
In the new back there is a supplementary slide which is raised by counterweights which operate in a cylinder. In operation, the regular slide is taken out and the camera allowed to come to rest; then the focus is checked through the magnifier, which is swung out of the way, and a catch is removed on the supplementary slide, which rises slowly and steadily without vibration.

Instrument developed for measurement of quantitative and qualitative hardness of all materials

"Monotron" Hardness Indicator

FOR the measurement of what is known as quantitative and qualitative hardness in both metals and non-metallic materials, the "Monotron" hardness indicator was developed by the Shore Instrument & Mfg. Co., Jamaica, N. Y. The instrument is a static mechanical pressure machine acting on a small diamond ball impressor through a specially designed high-duty weigher or pressure scale. The resulting depth of impression under load is measured by a standard micrometer gage reading to 1/5000 in. The graduated pressure scale has a capacity of 160 kg., and also reads up to 352 lb. A compensator device is fitted to the indicator to correct the hitherto unavoidable errors due to contraction of the parts in the machine and the diamond itself when under strain.

The diamond ball point is 5/8 mm. in diameter and is made to penetrate the material to a depth of 9/5000 in., thus producing an impression diameter of 0.36 mm. The comparative hardness of the material is measured in terms of the pressure necessary to produce this constant impression. The result can be expressed in per cent of hardness as compared with steel of known hardness. If the material is quite soft, such as rubber or fiber, a comparison can be made against a soft metal such as copper, which in turn can be standardized against hard steel. The diamond size was chosen so that the scale will include all metals from the softest up to the hardest steel without unduly straining the diamond on a hard specimen. The resulting impression causes slight injury to the finished surface. In a scale of 160 kg. a substantial margin of overcapacity is allowed since a super-hard steel rarely exceeds 125 kg. under standard conditions.



"Monotron" constant-diameter hardness indicator with removable tilting table

Special scales may be applied to the instrument to read in terms of Scleroscope and Brinell hardness numbers, or unit stress values may be used. A diamond of any other shape or standard steel balls of larger size may be used for special purposes, particularly for accelerating the examination of soft metals. By a comparative method, these values are always reducible to the standard values.

By means of a flat end punch of constant diameter, it is possible to measure the comparative ductility of metals. In this case a constant pressure is applied, 125 kg., and the depth of impression is the variable factor, being proportional to the ductility. It is also possible to measure the depth of hardness by plotting the load against the depth of impression. If a steel specimen is decarbonized so that it is harder inside than out, the increment line will bend upward; if, on the contrary, the specimen is case-hardened, but of limited depth, the increment line will bend downward as the load is increased.

The photograph reproduced herewith shows the Model A complete with a removable tilting table. In operation the specimen is put on the table of the machine with the top surface approximately level, and the ram is advanced downward until the hexagon cap contacts with the piece. The hand lever on the side is then turned until the lower or micrometer gage hand is moved to a responsive resting position, at which point the micrometer needle is adjusted to O by means of a thumb screw. The hand lever is again moved until the idler pressure bar reaches the weigher mechanism. At this point the indicator hand on the large dial begins to move away from O, and at the same time the hand on the micrometer gage also moves until the required definite penetration is reached. For standard hardness measurement this would be 9 divisions of the scale. The pressure reading is then taken from the larger dial in kilograms or pounds. The operation is quite rapid.

Pressure is furnished through a simple plate spring loaded as a beam in the center and carried on roller bearings. The spring is checked with a weigher scale and is stressed well within its elastic limit, so as to maintain its accuracy over its full range. A special built-in micrometer mechanism transmits the deflection of the spring to the needle of the dial.

The Model A Monotron hardness tester has a capacity between the base and impressor point of 7 in. The largest distance from the center to the back of the frame is 4¼ in. It has a minimum height of 17 in. and weighs 61 lb.

Thermal Expansion of Beryllium

SOME data on the linear expansion of beryllium have been published by the Bureau of Standards. The investigation on the thermal expansion of this metal and aluminum-beryllium alloys (4 to 33 per cent beryllium) was undertaken because of the interest shown in aluminum-beryllium alloys in connection with automotive engine pistons, there being no information available on this subject. Expansion determinations were made over various temperature ranges between —120 and +700 deg. C. on a sample of beryllium (98.9 per cent) and between room temperature and 500 deg. C. on the aluminum-beryllium alloys.

Beryllium, a metal about 30 per cent lighter than aluminum, has received until recently very little attention. This interesting metal expands considerably less than aluminum and approximately the same as iron or ordinary steel.

Aluminum-beryllium alloys also expand less than aluminum. For example an aluminum-beryllium alloy containing 30 per cent beryllium has co-efficients of expansion approximately 20 per cent less than those of aluminum. The relations between the coefficients of expansion and the chemical composition were compared with the equilibrium diagram obtained by Oesterheld, and were found to be in agreement with the theory for this type of diagram.

A scientific paper which gives detailed data on beryllium and aluminum-beryllium alloys has been prepared. It is believed that this paper will be valuable to persons interested in the properties of light alloys.

NEGOTIATIONS are under way looking to the establishment of an air service between Moscow, Russia, and Teheran, Persia. The Russian national air transport company Ukrowosduchputj has made an arrangement with the Persian national air service, operated by Junkers, according to which, since there are no landing facilities at Astara on the Persian-Caucasian border, the Persian planes are to land at Baku in Caucasia and the Russian planes at Enseli in Persia. This agreement still lacks confirmation by the respective governments.

Experts Stress Present Safety of Air Transportation

Speakers at Philadelphia meeting are of opinion that aviation is as dependable as other forms of transport. Engine failures seldom responsible for accidents.

By K. W. Stillman

IN spite of the numerous tragedies and near tragedies which have occurred recently in connection with various stunt flights and which have given aviation so much rather unfavorable publicity, air transportation today, when properly conducted, is as safe as any other means of transportation and new developments are constantly making it still more safe.

This was the consensus of opinion expressed during an extremely interesting all-day session devoted to the subject of Safety in Aviation held in Philadelphia, Oct. 18, and sponsored by the Engineers Club of Philadelphia, The Aero Club of Pennsylvania and the Philadelphia Section of the A.S.M.E. Over a dozen speakers, including Commander Richard E. Byrd, Col. Clarence Chamberlin, Harry F. Guggenheim, and other well-known Army, Navy and commercial aviation experts discussed the subject of safe aviation from every angle, each one of them arriving at the conclusion expressed in the preceding paragraph—that air transportation is now relatively safe as compared with other forms of transport and is constantly becoming still more so.

Safety is obtained when a responsible organization operates well-designed planes, fitted with the best equipment and handled by expert pilots. Under such conditions, it was believed, and the experience of several operating companies has proved, that air transportation can be made as safe and reliable for mail, express or passenger transport as any other form.

Of particular interest to automotive men who, possibly, are more interested in powerplants than any other part of aircraft, was the assertion made in a paper by Commander B. G. Leighton, U. S. N., that the rather popular opinion that engine failures are the most frequent causes of crashes is wrong; that, in fact, actual failures of the engine occur so infrequently as to be of relatively minor importance in working for further safety.

During the past two years, he said, navy fliers have put in about 187,000 hr. of flying under all sorts of weather conditions and over all kinds of terrain. During this period there have been 377 crashes and for this purpose a crash is considered anything which necessitates repair work of any nature before the plane can be flown again, such as a broken landing gear, and without regard to whether the fliers are injured. Of these 377 crashes of all kinds about 25 per cent were caused, indirectly at least, by engine failures, and in 120 the personnel was injured. Of the crashes in which personnel was injured only 10 per cent were caused by engine failures. Only one death was caused by an engine failure and this was in a ship powered with a pre-war engine.

Even these relatively few engine failures are not entirely due to inherent faults of the engines, Com. Leighton said, but at least half are caused by faulty ground work or improper operation by the pilot. The only real difficulty now being experienced with aircraft engines is in the fuel and oil lines and this, he pointed out, was the job of the airplane constructor to correct and not one for the engine builder.

The greatest item in improving the safety of an aircraft is to decrease its power-load factor, he asserted. That has been the main reason for the adoption of the air-cooled engine by the Navy—not that they are inherently better than water-cooled powerplants, as experience shows the two types to be about equal in operating characteristics and reliability—but that the air-cooled engines are lighter so that their use permits a lowering of the power-loading. He believes that a power loading of 20 was about the maximum that could be safely used and stated that the reduction of this factor was the most important thing which could be accomplished to increase the safety of air transportation.

Commander Richard E. Byrd, who was one of the speakers at the "Safety-in-Aviation" meeting in Philadelphia

Another bit of experimental data was given by C. Townsend Ludington, chairman, technical committee, National Air Transport, Inc., who said that the Western Air Express, which has the air mail contract between Salt Lake City and Los Angeles, has flown in all sorts of weather over the several mountain ranges of its route, some 306,000 miles, during the period from Jan. 1 to Aug. 1 of this year, without a single forced landing, and

during the past six months it has not had a single accident of any kind.

His own company, Mr. Ludington said, has flown a total of 1,086,000 miles since its inception in May, 1926, until the first of October of this year, and its route from New York to Chicago includes, in crossing the Alleghanies, some of the worst weather to be found in the country. In spite of this, the company has maintained an efficiency of 96.1 per cent in scheduled flights, and has experienced only 149 forced landings, of which 114 were caused by weather conditions.

Air Commerce Regulations

During the afternoon session, Major Clarence M. Young, director of aeronautics, Department of Commerce, and during the evening session, Col. Blee of the Department, discussed the air commerce regulations and what the Department of Commerce was doing and was planning to promote commercial aviation. All national airways are to be equipped for night flying—4000 miles of the 11,500 miles total now being so equipped and the completion of 3000 miles additional is promised for June 1, 1928. Revolving beacons, consisting of 1000-watt incandescent lamps, are being placed at intervals of 10 miles along the air routes. Where commercial current is available these beacons are made entirely automatic by means of a sun valve which lights and extinguishes the lamps as the sun sets and rises.

Every 30 miles along the air routes, intermediate landing fields will be provided averaging from 1300 to 1500 ft. sq., which will have their boundaries outlined at night by lights and which will also be beacon stations.

Through the Coast and Geodetic Bureau, strip maps are being provided for all the air routes and the Weather Bureau is rapidly developing a country-wide radio and telegraph service to inform aviators of weather conditions at any point along their proposed routes.

The Bureau of Standards is working on a number of developments, Col. Blee said, which will be invaluable aids to air navigators, one of which, the radio beacon, is practically ready to be placed in production by commercial organizations. Some commercial transport concerns are already making use of this device to guide their pilots during thick weather and plans are now being made to equip 1600 miles of the national airways with radio beacon service.

Radio Mile Post

Other devices under development include the radio mile post, to be located at intermediate landing fields and arranged to give passing pilots definite information concerning their location; two-way radio telephony by means of which pilots can carry on conversation with ground stations or with other pilots; the radio localizer which, in foggy weather, will give the pilot exact information as to the outline and position of landing fields; and the radio altimeter which will give the pilot his exact height above the ground when he is attempting a landing in the fog.

An additional statistical item in regard to safety was given by Col. Blee in his statement that during the three years of operation of the air mail under the Post Office Department, including trans-continental day flights and New York-Chicago night flights, 96 per cent of all scheduled flights were made and the ratio of miles flown to fatalites was 2,292,263 to one.

At the afternoon session Col. Chamberlin spoke on aircraft safety from the pilot's viewpoint and emphasized the importance of the general flying qualities of the plane, particularly with its ability to float down when put in a stall; visibility for the pilot; location of the instruments in such a manner that the relative positions of all the important ones can be seen simultaneously at a glance; stability and reserve power. He believes that a very frequent cause of accidents is the presence of water and dirt in the fuel and suggested that means be provided for preventing this condition or making its remedy easy during flight.

At the evening session, when he was called on unexpectedly to reply to the facetious remarks which Commander Byrd made about him and his trans-Atlantic flight, Chamberlain said he was thinking seriously of another attempt but it would be done the next time with a ship equipped with at least three and preferably four engines, with two expert pilots and a radio operator and everything else of this nature which would aid in making the voyage successful for, he said, "You may take it from me, it's a big leap."

Commander Byrd expressed the opinion that, with the exception of fog, air navigation was quite as practicable and could be done quite as accurately as with ships of the sea. In fog, however, airplanes must keep going with no means of telling where, while ocean vessels can stop and wait for the fog to lift before proceeding so that their position may be known constantly. The radio beacon looks like a solution to this problem, Commander Byrd thinks, although he was insistent that some form of device must be developed which will penetrate the fog and enable a pilot to see before air travel under such conditions can be made entirely satisfactory.

Lost in the Fog

In his opinion, some, if not all of the recent tragic attempts to cross the oceans, have failed through lack of knowledge of navigation. He pointed out that on his own trip, equipped with the best instruments available, he became lost over France in the fog and was traveling in a circle for some time before righting himself. He thought that some of the trans-oceanic aviators might have become lost in the fog, left their proper route with no way of getting back on it and run out of fuel before they could find their way again.

He suggested that the latest attempt, that of Ruth Elder, ended happily only by luck. The ship was off its course and the pilots had no way of knowing where they were in order to make for land when engine trouble developed, or even to get in the ship lane, but were extremely lucky in locating a ship. Chamberlin's trip was placed much in the same class, as Byrd reviewed the trouble the former had in discovering where they were when they finally approached the shores of Europe.

Other speakers of the day included J. Brooks B. Parker, who discussed the problems involved in the insurance of aviation activities; Capt. H. C. Richardson, U. S. N., who gave a paper on the structure and materials of modern aircraft as they affect safety; Lieut. Edwin E. Aldrin, U. S. A., who discussed safety from the standpoint of aeronautic design; Harry Guggenheim, sponsor of the Daniel Guggenheim Fund; and Capt. Emory S. Land, U. S. N., who treated the relationsips between military and commercial aviation activities.

The morning session was devoted to an inspection trip through the aircraft factory at the Philadelphia Navy Yard. Exhibition flying which had been planned by Navy fliers stationed at the Yard was prevented because of the weather.

New Developments—Automotive Parts and Production Tools

Goss & De Leeuw Chucking Machine

THE Goss & De Leeuw Machine Co., New Britain, Conn., has added to its line a four-spindle automatic chucking machine of the same general type as its well-known 6 x 6¾-in. machine. This new and larger machine will be known as the 11 x 10-in. size, handling work up to 10⅞ in. in diameter and 10 in. long.

This machine is of the multiple spindle type in which the cutting tools revolve. The work is held on the turret and feeds against the tools. The turret is of such a design that different types of work-holding devices may be used. Two-jaw chucks are most generally used, but three or four-jaw universal chucks can be furnished at extra cost. Also, when required, special features and drawback arbor attachments can be supplied. All the regular machining operations can be handled, and oil-grooving (either straight or helical) and light broaching also can be done in the standard machine.

The time required to produce work is that required to perform the longest single operation. Quite often this longest operation can be sub-divided over two or three tools, and in this way the time can be further reduced. The return stroke of the feed cam, the index time, and the advance stroke of the turret (up to the feeding section), as well as the speed of the pump for the cutting solution, remain constant no matter at what speed the machine is operating.

Large Bearing Surfaces

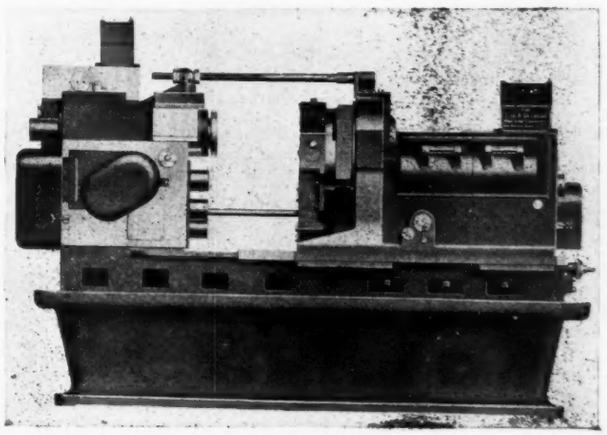
Spindles Nos. 1, 2 and 3 have large bearing surfaces, 4½ in. in diameter by 6½ in. long, and are hardened and ground to size. The drive of the spindles is through individual change gears. In addition to these individual spindle change gears, the machine has a set of main change gears. By incorporating these gears in the machine the speed of spindles Nos. 1, 2 and 3 can be increased, as a whole, for brass work, or decreased for harder material such as cast iron, steel, etc. These change gears when used in conjunction with the individual spindle change gears give the machine a wide range of cutting speeds.

All threading operations are accomplished on spindle No. 4. This spindle is mounted in a separate threading slide and all threading operations are controlled by the Goss & De Leeuw lead screw arrangement. These lead screws and nuts are quickly changed for various pitches, and inside and outside threads of different pitches can be cut at the same time. When the machine is threading, the threading slide and the turret slide are locked and move together. The threading spindle also has large bearing surface, the front bearing being 5 in. in diameter by 6½ in. long; it is fitted with a large flange and pilot hole and cross key for attaching, locating and driving the die heads used on the larger class of work.

The threading spindle is fitted with a safety clutch which will protect all threading tools should the tap or die bottom in the work due to incorrect setting. This safety threading clutch can be adjusted to the power required to drive the different size dies or taps used. The threading spindle is driven through compound change gears, which makes it possible to obtain correct speeds. A sliding back gear reduces the speed by 2½ to 1, so that when the threading spindle is geared for the largest size tap within the capacity of the machine, the total back gear reduction from the driving shaft to the threading spindle is 20 to 1. The machine will thread up to a 3-in. pipe tap in iron, or 3½-in. pipe tap in brass.

The turret and turret slides are fed by a cam, and moved forward and back as a unit. The slide has long, wide bearings on the bed and a narrow guide, thus insuring proper alignment and obviating sagging of the turret. Indexing of the turret is by the Geneva stop motion. The turret is positioned by a locking bolt which is flat, hardened, and moved between a hardened plate and a hardened taper gib. It acts on slots which are accurately spaced in the Geneva wheel. The Geneva wheel is securely bolted to, and so becomes a component part of, the turret. This construction eliminates twist in this very important part of the machine. The working face of the turret is 28 in. in diameter, and when indexed it turns in a 20-in. bearing in the front of the slide.

The turret has a circular beveled plate at its back which acts against a similar plate integral with the slide itself. The beveled edges of these two plates form a clamping surface of circular V-section which is surrounded by a split-ring which fits over it. This clamp locks the turret solidly to the slide after the locking bolt has entered and positioned the turret. This design pulls



Goss & De Leeuw four-spindle automatic chucking machine

the turret back solidly against the large seat on the slide, and also removes all torsional strain from the locking bolt. The clamping surfaces and ring are protected against chips and dust.

The cam drum is mounted in the slide, and is used only for the feed and return of the turret slide. This makes the diameter of the cam small and does away with all idle space on the drum, the cam using all but 1 in. of the whole circumference. The cam stands still while the indexing takes place, and vice versa. The mechanisms for these two functions are so interlocked that there is no possibility of getting out of time. All cam sections are jig-drilled and any stroke cam within the range of the machine can be obtained.

All important gears used in the machine are of chrome-nickel steel, heat-treated. All running parts subject to wear are hardened and ground and run in bronze bearings.

The cam roller is mounted on a slide between the main ways of the machine, and is locked firmly to the bed during all machining operations. The positioning of this slide accurately locates the turret. A screw with a micrometer collar acts directly on the roll slide, which insures a very accurate adjustment. This feature is of especial value when accurate facing must be done. It also permits of the rapid final adjustment of the work after a trial out has been taken.

In order to give confidence to the operator, and to make it possible for one man to handle two or more machines, a safety device has been incorporated in the machine. As soon as the operator completes the placing of the work in the chuck, he trips a hand lever in the loading position and the indexing can then start when the return of the slide is completed. The lever can be moved at any time as soon as the work is placed, and the machine will not stop unless the operator has consumed more time than allowed by the machine cycle.

Standard equipment includes hand-operated two-jaw side screw chucks which are not milled the full length of the body, but have a solid box section. With this construction it is impossible for the chuck jaws to spring, no matter how tightly the work is gripped. Wear in the jaws is said to be very slight, due to the large area of the bearing surface, and to the ground plug fits between the jaws and the bodies. When tooling, boring bars supported in hardened bushings in the center hole of the chuck are recommended for all work having cored holes large enough to allow the pilots to pass through. The chucks have a wide bearing on the turret, and the bolt holes in the turret have removable bushings.

An electric chucking and unchucking device is offered at extra cost. With this arrangement the operator does not have to use a chuck wrench but trips an electrical device with his foot which engages the square on the end of the chuck screw.

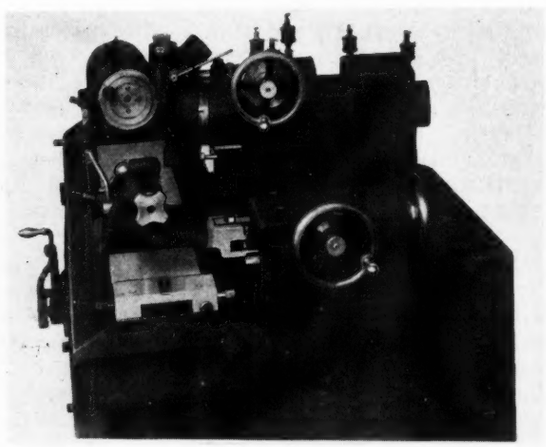
The machine is arranged for motor drive only, the motor being mounted on a separate base. A silent chain with the necessary guard is used to drive from the motor to the machine.

To help in setting up, the machine is fitted with hand feed, the operator using a crank handle wrench for this purpose. The hand-feed shaft does not run while the machine is operating. This eliminates danger to the operator. The power feed can be thrown in or out from the front or back of the machine.

New Lovejoy Shock Absorber

This new Delco-Remy-Lovejoy shock absorber for cars in the low price field was announced last week. It employs the same hydraulic principle as the larger Model J Lovejoy but is priced lower

Barber-Colman Reamer Control



Detail of Barber-Colman reamer sharpener showing position of auxiliary platen

IN *Automotive Industries* of Oct. 1, a brief description was given of the new system of reamer control developed by Barber-Colman Co., Rockford, Ill. This consists of a complete line of solid and adjustable blade reamers and a reamer sharpening machine. The latter device has been designed to eliminate all hand work on reamers and will hold all the essential dimensions of a properly sharpened reamer to very close limits while the entire job of sharpening is completed under positive mechanical control and is almost fully automatic.

The various dimensions which can be maintained with a high degree of accuracy by mechanical means with the reamer sharpener include the diameter cutting clearance immediately back of the flute; the secondary or relief clearance; the lead-up or taper at the nose of the reamer; the drop-off or chamfer at the head of the tapered section and, where necessary, a relief or taper behind the point where the actual reaming is done.

All this is done by means of a 4 in. straight cup grinding wheel mounted on a spindle provided with very delicate feeding mechanism and a work table whose movement can be controlled by various types and shapes of cams.

The main platen or slide is provided with one flat

and one V-way. An auxiliary platen is mounted on the main platen, pivoting at one end and rolling on flat ball bearings at the other end to permit very sensitive movements for following the form of the cam. The head stock is gear driven with the live center eliminated by means of sleeve gears and it is provided with a special driver for determining definite cutting and relief angles making it unnecessary to make special settings for each angle.

Two Slides Provided

The cam block slide is mounted on the base at the free end of the auxiliary platen. Two slides are provided, one to permit the grinding of back taper and the other to vary the length of bevel on the end of the reamer while grinding and without changing of clearances or nose form. This cam slide block is also provided with a trip release mechanism for taking the work out of its path on the return stroke.

There are four nose beveling cams which are interchangeable and permit grinding reamers for through hole, bottom hole, hand reaming and cylinder reaming. Special cams can be provided for almost any special form desired.

A 2 hp. motor running at 1150 r.p.m. provides power. Net weight of the machine is about 4000 lb.

Car Puller for Factory Yards

Galion car puller installed

IN the loading and unloading of railroad cars it is often necessary to have a practical means of moving and spotting cars. For such purposes a car puller has been developed and placed on the market by the Galion Iron Works & Mfg. Co., of Galion, Ohio, as an adjunct to the Galion skip hoist and Galion Mono-Veyor.

This new car puller can be supplied with a 5, 7½, and 10 hp. electric motor as desired. Gear reduction is by means of machine cut steel gears running in a bath of oil in a dust proof cast-iron housing of heavy, ribbed construction. The capstan being vertical, cars can be pulled from all directions.

The illustration shows the puller in operation. A shelter shed is provided for the rope which is very convenient and desirable, as rope exposed to the weather deteriorates much faster than if protected. The shed also makes it easy for the operator to store the rope and safeguard against theft.

Phomene Accumulator

THE Phomene Accumulator is a new device developed by the Pyrene Manufacturing Co., Newark, N. J., to provide automatic protection against fire in plants where flammable liquids are employed. The new device is of the foam type and is entirely self-contained.

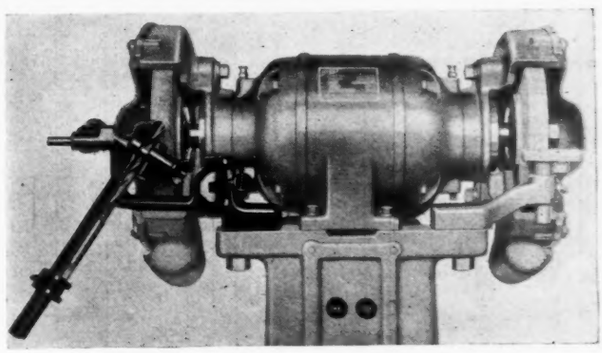
A water line connection is made at the bottom of the accumulator and a foam distributing line run to the hazards. Valves in the water line are opened automatically by thermostats placed at the hazards. Dry powder is used. The accumulator contains 275 lb. of powder which forms 2400 gal. of foam at average water pressure and temperature. The foam is free flowing and tenacious and will float on liquid surfaces and adhere to solid surfaces.

Artos Wire Cutting Machine

IN the description of the Artos wire cutting and stripping machine, which appeared on page 591 of the Oct. 15 issue of *Automotive Industries*, the capacity was given as 3600 pieces cut and stripped per minute. This is an error, the rate of production being 3600 pieces per hour.

Drill Grinding Attachment

A TWIST drill grinding attachment for use with Hisey electric bench and floor stand grinders has been announced by the Hisey-Wolf Machine Co., Cincinnati, Ohio. This attachment is a self-contained unit and is interchangeable with the standard tool grinding rest; it can be quickly mounted in position. It is claimed for this attachment that it permits of grinding twist drills both more rapidly and more accurately than the old free hand method. It eliminates the use of gages, a graduated micrometer screw adjustment assuring identical lip lengths. The use of a 60 grit wheel of medium grade is recommended. Any straight or taper shank twist drill from ¼ to 1¼ in. diameter can be ground on the attachment.



Hisey twist drill grinding attachment shown on floor stand grinder

FOLLOWING the example of France, Italy a year and a half ago passed a law requiring the addition of alcohol to all motor gasoline. It now appears that the law makers at the time had no idea of the quantities of alcohol required if the law were to be enforced, and since there is little or no alcohol available in the country for the purpose the law has remained a dead letter so far. Now a committee of experts has been appointed to propose ways and means of procuring the necessary quantities of alcohol within the country.

U. S. Exports of Cars, Trucks, Tires and Parts

COUNTRIES	PASSENGER CARS										TRUCKS					
	Up to $500		$500 to $800		$800 to $1,200		$1,200 to $2,000		Over $2,000		Up to 1 Ton		1 to 2½ Tons		Over 2½ Tons	
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
Austria					1	$829	6	$7,352								
Azores and Madeira Islands			5	$2,874	6	4,535	5	6,731			9	$5,551				
Belgium			158	87,577	902	795,224	258	330,681	42	$96,560	144	63,252	3	$5,850		
Bulgaria					6	5,964	3	4,161								
Czecho Slovakia			5	3,075	7	5,061	8	9,899	3	5,894	8	3,799				
Denmark and Faroe Is.	2	$1,274	232	111,464	378	281,385	98	123,660	3	6,351	386	158,934	12	13,758		
Esthonia					3	2,360	1	1,129					1	1,160		
Finland			3	1,807	83	70,576	21	27,888	7	16,195	5	3,985	7	9,133		
France			3	1,999	52	49,614	80	107,478	40	101,829	34	15,606				
Germany			63	34,549	385	340,199	119	159,181	63	134,204	153	72,756	3	5,013		
Gibraltar																
Greece	4	1,750	6	3,970	44	34,080	4	5,625	2	5,005	4	2,988	1	921		
Hungary			5	3,296	8	6,438	8	9,289	3	5,623						
Iceland			1	668	1	859					2	918				
Italy			20	9,501	33	28,078	21	24,357	11	26,971	10	4,590				
Latvia					1	763										
Lithuania					3	2,231										
Malta, Gozo and Cyprus Is.					4	2,988	1	1,241								
Netherlands			13	8,826	78	65,449	71	85,350	15	36,383			1	1,126		
Norway			16	9,273	56	44,899	31	37,328	10	23,296	9	7,007	22	27,671	12	$39,600
Poland and Dantzig			15	9,015	11	9,565	14	16,680	3	5,916						
Portugal			96	47,378	17	13,112	14	15,671	5	10,981	120	54,744	3	3,683		
Rumania			34	21,083	63	52,451	55	66,747	8	15,256	4	2,277	1	665		
Russia	3	1,064			3	2,786	11	18,766	4	12,148	12	5,101	5	7,278	11	75,961
Spain			292	172,515	274	232,732	190	247,548	48	108,730	237	109,415	15	16,742		
Sweden			53	33,113	185	148,961	140	173,137	12	28,948	13	10,331	24	29,309		
Switzerland			19	11,678	33	25,548	51	60,803	19	41,766	3	2,274	10	11,702		
Turkey			31	17,391	20	14,674	4	5,920	2	3,249	19	9,993				
United Kingdom	108	50,152	350	204,128	305	240,870	42	59,149	36	81,858	302	140,458	20	27,629	1	4,534
Irish Free State			6	4,655			3	3,410	1	1,872						
Yugoslavia			11	5,752	5	3,600	4	4,318			1	578				
United States																
British Honduras					1	667							1	1,000		
Canada	424	117,690	2,207	725,373	779	687,721	191	278,528	50	137,335	177	90,392	223	348,019	37	93,039
Costa Rica			2	1,262	20	17,885	15	17,783	1	1,749	2	1,375	5	6,016		
Guatemala					6	5,007	17	24,438	3	6,152			6	8,314	1	2,498
Honduras			1	600	4	3,280	2	2,374								
Nicaragua					3	2,060	9	10,186	2	4,897						
Panama	2	1,000	18	9,053	29	24,501	27	29,409	4	8,029	30	14,412	18	26,056		
Salvador					3	2,993	4	5,347	3	5,968					1	3,750
Mexico	154	53,084	150	91,451	84	83,291	73	95,366	14	33,655	58	36,599	15	23,258	1	2,700
Miquelon																
Newfoundland	2	700	2	1,208	6	5,332	1	932			1	433				
Barbados			2	1,020												
Jamaica	1	200	9	4,378	18	14,859	2	2,228					3	3,784		
Trinidad					11	9,229	1	1,070			2	1,083	4	4,780		
Other British West Indies	4	750	1	667	2	1,960					1	175				
Cuba	28	12,720	158	78,780	106	90,477	23	32,380	10	26,798	97	59,795	21	30,016	10	50,789
Dominican Republic	8	3,868	76	37,565	35	28,066	9	10,459	1	1,871	49	23,931	7	11,387		
Dutch West Indies			1	596	12	9,311	6	7,646			1	797	1	1,950		
French West Indies																
Haiti			1	677	3	2,315	3	3,711	1	1,871						
Virgin Islands	2	400	2	1,295	3	2,603					1	125				
Argentine	1,440	551,625	686	384,103	753	629,073	206	252,688	19	55,015	752	343,714	115	163,101	75	194,846
Bolivia			3	1,703			4	4,589			1	789	15	26,009		
Brazil	482	179,697	176	92,511	328	282,781	65	84,155	38	42,847	1,127	455,090	68	95,392	6	12,700
Chile	9	2,221	23	13,514	44	35,106	21	25,029	7	15,426	7	4,517	32	39,139		
Colombia	1	200	12	6,962	58	47,748	40	46,485	5	10,915	3	2,380	22	37,753	6	24,237
Ecuador			4	2,402			7	7,350	4	7,475			13	21,740		
British Guiana																
French Guiana																
Dutch Guiana			5	3,667												
Paraguay											7	3,914			2	4,812
Peru			12	6,267	30	26,549	11	13,435			7	5,122	28	38,495	5	7,764
Uruguay			212	112,727	64	53,366	29	35,518	9	21,164	175	109,098	25	34,871	10	41,252
Venezuela	5	2,226	9	5,513	29	22,753	20	23,115	15	39,444	5	3,846	13	16,541	2	8,651
Aden			6	3,284	1	717										
British India	8	2,452	42	30,689	116	93,566	17	21,637	3	5,593	92	71,294	22	17,286		
Ceylon	6	1,309	4	2,478	25	20,423	2	2,821	1	1,640	4	4,912	18	16,871		
Straits Settlements					37	30,148	14	14,870			4	3,312	6	9,501		
China	4	1,375	21	15,105	26	22,408					8	5,485	15	14,980	2	7,800
Java and Madura	3	1,440	951	469,115	284	234,470	64	71,671	11	22,328	722	341,767	44	35,342		
Other Dutch East Indies			27	17,463	21	16,813	1	1,492	5	9,600	8	6,485				
Hejaz, Arabia and Iraq			3	1,289	8	6,340	2	2,294	1	2,106	4	3,995				
Hongkong			7	5,088	4	3,617	1	1,845							1	7,144
Japan	35	9,848	132	78,362	56	51,446	58	78,577	1	2,032			12	13,181		
Kwantung	1	250	4	2,821			2	2,978								
Palestine and Syria			6	3,487	81	61,445	3	3,440			6	4,893				
Persia					4	3,001	1	982			2	908				
Philippine Islands	82	38,702	117	69,468	66	48,682	10	14,499	10	21,831	5	3,750			12	10,227
Russia					5	3,235										
Siam					6	5,022										
Turkey	3	1,312	9	3,996	3	2,674					1	514				
Other Asia																
Australia	922	310,507	744	370,856	648	513,001	366	446,711	70	137,515	1,858	872,166	180	259,647	28	79,403
New Zealand			51	24,879	103	79,466	63	70,345	2	3,813	100	45,393	25	31,977	3	7,397
British Oceania			3	1,893	1	742	2	2,595					2	1,760		
French Oceania			1	715												
Other Oceania																
Belgian Congo																
British West Africa	5	2,000	3	1,609	8	6,037	1	980	1	1,750	46	39,202	124	143,319		
British South Africa	385	133,579	236	131,688	635	476,161	269	308,848	27	58,875	252	118,106	43	66,695	1	2,722
British East Africa			6	3,012	7	5,278	10	11,282			4	3,558	12	12,275		
Canary Islands			3	1,807	5	4,410	4	6,670			4	1,836	3	4,525		
Egypt			189	95,946	153	130,642	46	50,821	5	9,868	100	47,725	2	3,009		
Algeria and Tunis																
Other French Africa			1	642												
Liberia					1	895										
Madagascar																
Morocco			2	1,337	15	13,668	7	8,754			57	26,478				
Portuguese East Africa			2	1,580	15	11,784	2	2,200			1	996	3	2,805		
Other Portuguese Africa					10	7,498					8	6,298				
Spanish Africa					6	4,976										
Total	4,133	$1,483,395	7,759	$3,727,500	7,748	$6,433,329	2,994	$3,754,332	660	$1,466,597	7,264	$3,441,217	1,274	$1,732,434	227	$681,826

for August, 1927 | Canadian Exports

ELECTRIC VEHICLES		PARTS	TIRES						PASSENGER CARS						TRUCKS		PARTS	COUNTRIES
			Casings		Inners		Solids		Up to $500		$500 to $1000		Over $1000					
No.	Value	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	Value	
		$27,370	5,637	$68,895	3,339	$8,669												Austria
		2,281	248	2,861	54	100	4	$310										Azores and Madeira Islands
		159,499	4,055	63,362	1,859	4,403	5	398			23	$17,793					$3,428	Belgium
		75																Bulgaria
		19,302	3,638	74,276	2,060	10,179	89	3,464										Czecho Slovakia
		233,320	11,939	145,354	9,369	16,573	18	987			3	2,180	3	$3,753			3,186	Denmark and Faroe Is.
		208																Esthonia
		41,923	3,047	38,117	2,375	4,776											51	Finland
		266,202	1,508	25,380	1,117	13,049					10	6,758	1	1,478				France
		1,367,153	18,137	285,593	12,506	27,514					35	28,444	1	1,470			4,240	Germany
			8	151	22	267												Gibraltar
		7,856	2,404	35,907	1,777	4,120	60	1,600										Greece
		4,281	428	7,409	336	1,222					5	3,863						Hungary
		1,133	136	2,910	73	206												Iceland
		36,033	14,851	170,490	12,056	25,993	1,355	22,549									349	Italy
		1,696	43	843	35	96												Latvia
		627																Lithuania
		547	92	969	50	78			5	$2,154	6	3,688			12	$4,634		Malta, Gozo and Cyprus Is.
		101,015	4,471	72,545	2,530	5,785	4	417										Netherlands
1	$4,845	36,559	2,341	33,171	2,463	5,220	31	1,173			20	11,862						Norway
		3,217	2,567	34,283	2,880	5,501	7	282										Poland and Dantzig
		16,367	1,814	27,916	1,651	3,456												Portugal
		8,293	2,439	31,423	1,988	4,500			132	54,006	12	7,114			72	27,875		Rumania
		40,632	6	179	6	22												Russia
		69,723	9,851	113,976	5,033	9,589	114	4,071									8	Spain
		110,377	7,958	109,997	5,057	10,157	2	50	2	970	90	51,000	19	19,190				Sweden
		11,446	4,249	71,548	2,426	5,176	97	5,158									113	Switzerland
		3,807	450	5,652	322	694							3	4,130				Turkey
		413,436	9,570	121,960	2,438	7,766	690	11,169	204	62,527	218	164,527	66	88,477			17,383	United Kingdom
		20,351	1,181	12,872	2,156	3,008	34	864									182	Irish Free State
		230	491	5,619	501	1,075	49	1,442	10	4,180			1	1,476				Yugoslavia
									26	3,955	1	700					2,852	United States
		729	20	201	56	106												British Honduras
3	8,800	2,713,853	1,295	25,979	4,255	9,674	52	2,827										Canada
		6,593	118	2,508	82	222			7	2,730	6	3,158			14	5,421		Costa Rica
		17,592	1,290	9,914	457	1,237	12	232							2	589		Guatemala
		2,993	75	1,637	73	214	20	1,201										Honduras
		1,644	81	1,406	62	256	18	665										Nicaragua
		17,975	336	4,547	411	959	10	257	95	39,595	8	5,703	4	5,338	222	90,133	185	Panama
		3,959	351	6,545	401	1,309			8	3,242								Salvador
		116,096	5,889	69,338	4,173	9,160	178	6,974	2	810					6	2,323		Mexico
			4	36	4	8												Miquelon
		3,088	121	1,657	205	392	2	20									1,100	Newfoundland
		2,406	38	543	8	14	4	75	3	1,228	3	2,289						Barbados
		23,436	243	3,670	31	68	107	2,703	15	6,077	5	4,287			10	4,136	18	Jamaica
		5,458	63	1,411	28	124			3	1,238	12	7,829			12	4,840		Trinidad and Tobago
		5,028	26	208	14	22	4	74	10	4,252					2	776		Other British West Indies
		92,042	6,197	96,235	13,865	21,428	373	13,624					5	5,419				Cuba
		20,334	1,450	16,512	1,639	3,688	60	1,903					4	4,354			34	Dominican Republic
		2,689	268	2,904	251	696			1	405			1	1,152	8	3,097		Dutch West Indies
		299	34	495					1	405	1	591						French West Indies
		5,039	870	3,681	383	813			6	2,418			1	1,115	14	5,420		Haiti
		610	20	134	14	31												Virgin Islands
		333,461	23,967	251,567	18,970	30,781	1,104	32,744	166	54,820	47	28,470	3	3,539			930	Argentina
		8,756	185	6,194	167	671	6	195	5	2,107	1	591			18	7,056		Bolivia
		206,219	5,589	69,053	1,251	2,195	161	5,988	11	5,185	24	21,048					264	Brazil
		68,166	2,493	44,561	1,666	3,317	330	9,319	108	46,420	21	12,214			95	37,101	576	Chile
		72,463	1,842	41,560	2,517	8,120	647	6,332	1	485	2	1,549	5	5,331				Colombia
		2,833	207	3,674	309	840			3	1,215					10	3,872	17	Ecuador
		628							6	2,464	3	1,945					145	British Guiana
		494																French Guiana
		525	26	205	18	23												Dutch Guiana
		3,046	98	1,243	175	326			3	1,217								Paraguay
		31,331	2,347	37,438	1,237	4,040	24	1,325	53	21,474	2	1,182			90	33,844		Peru
		56,452	1,998	29,077	976	2,231	38	1,376			17	12,310					594	Uruguay
		29,608	1,246	25,805	1,289	4,170	22	1,361	19	7,695	2	1,104			64	25,188		Venezuela
		2,194															848	Aden
		134,204	5,730	81,405	2,982	5,879	131	4,851	588	248,656	134	93,942	12	14,746	592	223,947	11,655	British India
		14,174	437	1,428	477	7,080			13	6,167	46	30,363	3	3,183	16	6,281	138	Ceylon
		51,056	5,894	54,736	654	1,793	105	2,212									19,959	Straits Settlements
		30,505	2,770	38,392	1,235	2,288	40	919										China
		125,536	6,676	75,554	2,858	5,810	38	1,927	30	14,480	13	9,160	22	26,528			13,818	Java and Madura
		16,222	700	7,783	553	886												Other Dutch East Indies
		6,685	665	7,220	223	572			23	9,595	3	1,711			37	14,233		Hejaz, Arabia and Iraq
		11,035	75	760	10	12			3	1,455	1	689	1	1,010				Hongkong
2	2,250	785,051	7,710	69,556	7,895	11,196	1,127	21,618			2	2,000	2	2,304			306	Japan
		1,861																Kwantung
		19,718	1,252	17,799	821	1,807												Palestine and Syria
		14,465	323	5,585	275	565			6	2,501					5	1,954		Persia
		33,573	12,908	156,114	7,076	14,629	1,653	30,484										Philippine Islands
																		Russia
		5,973	1,240	11,187	1,646	2,595											6,450	Siam
		1,540	409	4,972	695	1,377			5	2,084								Turkey
		813																Other Asia
5	3,905	421,079	4,586	71,708	1,442	4,415	315	10,895	283	112,500	2	1,126	2	2,754			71,939	Australia
		103,970	535	5,932	65	149	261	12,650	10	4,861	21	13,899	3	3,456			2,593	New Zealand
		911	12	301	18	72												British Oceania
		576	34	430	2	12	6	61										French Oceania
									4	1,666	4	2,690			4	1,661	244	Other Oceania
		205	17	429	30	117	10	317	1	405								Belgian Congo
		49,983	1,466	34,061	1,441	3,953			37	16,234	4	3,566			100	37,219	1,110	British West Africa
		121,266	3,059	38,004	2,171	4,393	113	3,846	3	1,217	17	9,414	2	2,932			9,061	British South Africa
		27,699	333	5,669	124	367	9	302	27	11,373	8	5,896			123	50,246	1,523	British East Africa
		3,690	1,000	14,717	409	850	54	2,609			1	595	3	3,314	13	4,960		Canary Islands
		175,556	623	8,442	727	1,337	87	2,734	51	21,262	8	6,460	2	2,972	31	11,919	543	Egypt
		212	106	809	136	178												Algeria and Tunis
															12	4,756		Other French Africa
			24	735	28	109												Liberia
		5,034																Madagascar
		8,959	2,037	45,445	1,211	3,574	20	514	20	7,662	7	3,851					7	Morocco
		3,863			30	54												Portuguese East Africa
		4,940	140	2,238	360	941			41	16,633	3	1,963			30	11,526		Other Portuguese Africa
		1,267																Spanish Africa
11	19,800	$9,044,619	233,107	$3,085,005	167,060	$363,339	9,700	$239,068	2,000	$812,025	851	$589,524	169	$209,421	1,614	$625,007	$175,849	Total

AUTOMOTIVE NEWS SECTION INDUSTRIES

Philadelphia, Pennsylvania

November 5, 1927

Car Sales Continue Lower; Truck Sales Show Strength

PHILADELPHIA, Nov. 5—The outlook for increased factory and sales activity in the automotive industry continues to hinge largely upon the appearance of the new Ford car. Sales in practically all parts of the country have shown a diminishing total during October and the November prospects are uncertain pending Ford action. The large decrease is in the low priced field though sales in better priced lines are likewise curtailed.

Farming centers such as Kansas City and Dallas, Tex., report slightly better conditions in October as compared with the same month last year and Atlanta, under the influence of cotton prosperity, also showed some improvement. Good truck demand in these territories accompanied the improved car movement. Farmer buying of trucks is also noted in other centers where there has been a slackening of car demand.

Stocks of new and used cars are reported higher in most territories than at the same time last year. Forced

(Continued on page 704)

Chevrolet Delivers 112,064 in October

DETROIT, Nov. 2—Chevrolet dealers delivered 112,064 cars in October, compared with 50,747 in October, last year, R. H. Grant, vice-president in charge of sales of the Chevrolet Motor Co., said today. This brings Chevrolet sales to more than 900,000 for the year to date. October was the largest retail month in all Chevrolet's history.

In spite of this outstanding new car sales record, Chevrolet dealers report but small increase in used car stocks, because there was a correspondingly large movement of used cars during October, Mr. Grant said. The company, he said, is anticipating a used car campaign to assist its dealers in cleaning up used car stocks.

During the month Mr. Grant visited many parts of the United States and reports business conditions good generally. "In the southeast and southwest, business was exceptionally good, due to favorable cotton and tobacco conditions. Business in the northwest was excellent on account of the great success of the wheat crops, and business in the middle west is improving as a result of the corn crop being larger than was expected."

Gardner Buys Engines

ST. LOUIS, Nov. 1—Gardner Motor Co. has contracted with the Lycoming Mfg. Co. for all its engine requirements for the year 1928.

Ford Dealers Shown Car Improvements

DETROIT, Nov. 3—Ford Motor Co. is continuing its plan of showing the new car to groups of dealers before settling finally upon details of construction. Dealer impressions are being sought only upon the finished appearance of the car and not upon mechanical features. This week dealers from the Cleveland territory were brought over in a Ford plane and shown the car.

As seen by dealers the new car is disclosed as of much lower appearance, an effect achieved by a combination of smaller wheels, flatter springs and new frame and axle design. The radiator shell bears the resemblance to the Lincoln shell that had been reported. Heavier full-crowned fenders are used. The bodies show a lower roof line, with downward curves at front and rear, a cadet type sun visor, higher belt lines decreasing depth of windows and giving appearance of greater length. A single strip belt molding follows the fender line curving upward around the back.

Production plans continue indefinite. It is expected that the company will produce enough cars of one model in November to supply all dealers with show cars. After these are built it is expected the company will rush to completion its final production plans to be ready for heavy output in January.

A last minute change to aluminum pistons is reported made on the new car. The original type was a semi-steel piston with convex head. It was of very light construction. In tests run on the new Fords at speeds of from 60 to 65 m.p.h. it was found that the light semi-steel pistons could not furnish sufficient heat conductivity.

Buick Schedules 22,000

DETROIT, Nov. 1—C. W. Churchill, general sales manager of Buick Motor Co., reports that Buick made approximately 23,000 automobiles in October and has 22,000 scheduled for November. New car stocks in dealers' hands were normal, he said, and demand is continuing larger.

N.A.C.C. Production 210,465 in October

NEW YORK, Nov. 3—Production of cars and trucks by members of the National Automobile Chamber of Commerce in October totaled approximately 210,465. This compares with 227,571 in October last year and with 268,529 in September, this year.

Production by N. A. C. C. members for the first 10 months of the year is increased to 2,811,489 as compared with 2,570,400 in the same period of 1926. This is an increase of 9.3 per cent above last year..

For the past two months the N. A. C. C. figures have approximated the total for the industry as released by the Department of Commerce.

Rubber Accessory Makers Consolidate Sales Effort

BOSTON, Nov. 1—Dexter Consolidated Rubber Co. has been organized here to consolidate the sales divisions of five leading automotive rubber accessory manufacturers. Main sales and executive offices will be here with branch offices and stocks in New York, Chicago, San Francisco, Atlanta and Dallas. E. R. Dexter will be president.

The manufacturers grouping their sales interests are essentially builders of non-conflicting specialties, the line consisting of cord patches, tire flaps, repair kits, rubber cements, fan belts, radiator hose, floor mats and rubber accessories. As result of economies effected it is expected that retail prices will be reduced from 10 to 25 per cent.

Erskine Averages 54.1 m.p.h.

AMATOL, N. J., Nov. 1—A record of 1298.4 miles was established by an Erskine stock sedan in a 24-hour run on the Atlantic City Speedway for an average of 54.1 m.p.h. An Erskine coupe, also competing, averaged 53.2 m.p.h. The trial was under the sanction of the American Automobile Association. A heavy rain storm prevailed during 14 hours of the run.

Packard Electric Adds Line

WARREN, OHIO, Nov. 1—Packard Electric Co. will announce at the Automotive Equipment Association show, a new group line of battery cables. With this new line 41 items will constitute a complete stock as against 225 formerly.

N.A.C.C. Rallies Tax Repeal Forces

Again Urges Members and Dealers to Demand Action After Mellon Report

WASHINGTON, Nov. 2—Following Secretary Mellon's statement to the Congressional Ways and Means Committee that he did not approve of the repeal of the excise tax on automobiles, the National Automobile Chamber of Commerce sent this week a call to members to again demand of their representatives in Congress that they be eliminated. Members were also urged to have their dealers and distributors make similar demand.

Secretary Mellon's objections to the repeal were based upon the assumption that automobiles are a semi-luxury, that they are competitive with railroads which are taxpayers and that the Federal government is entitled to this tax because of its expenditures for highway construction. He said the excise tax burden upon tobacco users was much heavier than upon automobile buyers.

H. H. Rice, assistant to the president of General Motors Corp. and a member of the committee on Federal taxation of the Chamber of Commerce of the United States, told the committee the chamber "stands unequivocally for the repeal of the automobile tax."

It is clearly a nuisance tax, he declared, and was a great annoyance. He further pointed out that the automobile "long ago passed from the non-essential class to have become the greatest influence of the present day in its effect upon the social, educational and economic life of the nation."

The speaker took sharp issue with Secretary Mellon's statement that the railroads were hurt by automobile competition, pointing out that they were greater sharers in the general prosperity which the use of the automobile has brought.

The National Retail Dry Goods Association, representing eight large retail organizations, and the American Farm Bureau Federation, also joined with the U. S. Chamber in voicing their appeal before the committee for the repeal of the automobile tax.

Car Fatalities Increase

NEW YORK, Nov. 1—Elevated sidewalks or subways at intersections would prevent many traffic accidents, according to Alvan Macauley, chairman of the Traffic Committee of the National Automobile Chamber of Commerce. To make such devices entirely practicable, he says, escalators should be used, if possible. Although nine of the 10 large cities of the country had a lower motor fatality for September this year than in September, 1926, the total for all major cities was 644 against 615 a year ago. For the nine months the total was 4606 against 4290 in 1926.

Carolina Members to Vote for Repeal

GREENSBORO, Oct. 29—So far as North Carolina members of Congress are concerned the 3 per cent war excise tax now collected on automobiles will be repealed at the forthcoming session of Congress. Charles S. Wallace, of Morehead City, president of the Carolina Motor Club, and James P. Harris, of Charlotte, president of the North Carolina Automotive Trade Association, have in hand communications from both North Carolina Senators and all Congressmen indicating that they are in sympathy with the repeal of the war excise tax.

Firestone to Direct Plantation by Radio

AKRON, Nov. 2—Establishment of radio communication between the Du River headquarters of the Firestone Plantation Co. in Liberia and the tire factory headquarters in Akron is announced by officials of the Firestone Tire & Rubber Co. Radio equipment is now being shipped to Monrovia. So far as is known this is the first American company to establish direct radio communication with Africa.

The Firestone Plantations Co. is steadily increasing its planting and engineering organization in Liberia. Development of larger acreage is being pushed with vigor, it is reported. Approximately 15,000 acres of jungle has been felled, cleared and planted with rubber trees.

Casing Prices Reduced 5%

AKRON, Nov. 2—Firestone Tire & Rubber Co. has reduced prices 5 per cent on high pressure and balloon casings in its first grade line. Reductions are in addition to the 5 per cent trade discount allowed dealers. There is no change in prices on tubes or on the Courier and Oldfield brands.

Norton Opens Storehouse

WORCESTER, MASS., Nov. 1—The Norton Co. has opened a new storehouse at 5805 Lincoln Ave., Detroit, which will house the district offices and storerooms formerly located at 233 West Congress St. The new building, a three-story brick structure, 124 x 100 ft., is the largest district storehouse for grinding wheels in the world.

Auburn Orders Axles

CLEVELAND, Nov. 1 — Columbia Axle Co. has received orders for 15,000 sets of axles from the Auburn Automobile Co., to be delivered during the first four months of 1928.

Business in Brief

Written exclusively for* AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co.

NEW YORK, Nov. 3—Business developments of the past week have tended more to accentuate the position of this fall's trade and industry than to reveal any alteration in the trend of commercial activity. In financial markets the decline in stock prices which has been in progress since early in October has been somewhat retarded. Call money remains plentiful, partly in response to the reduction in volume of brokers' collateral loans reported last week. Wheat and corn prices were slightly higher during the week, while the price of cotton fluctuated irregularly. Warm weather last week further retarded the progress of late fall and winter retail sales, while greater activity appeared in wholesale trade.

FREIGHT CAR LOADINGS

Railroad freight car loadings in the week ended Oct. 15 numbered 1,119,872, as compared with 1,100,552 in the previous week and 1,202,780 in the corresponding period a year ago. Total loadings so far this year amount to 42,218,318 cars, as against 42,691,887 cars in the same period last year and 41,218,272 two years ago.

PETROLEUM OUTPUT

Production of crude petroleum again declined during the week ended Oct. 22, average daily output for that period being 2,481,750 bbl. which compares with 2,494,350 bbl. a week earlier and 2,286,250 bbl. in the corresponding period a year ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices was lower last week at 145, as against 146.2 in the previous week and 145.5 four weeks earlier.

BANK DEBITS

Bank debits to individual accounts, as reported to the Federal Reserve Board for the week ended Oct. 26, were 8.3 per cent lower than in the preceding week and 14.6 per cent above the amount reported in the corresponding period of 1926.

FEDERAL RESERVE STATEMENT

For the same period the Federal Reserve banks reported that reserves declined $19,600,000, discounts $15,200,000, note circulation $13,800,000 and deposits $25,600,000. Open market purchases rose $18,600,000 and U. S. Government securities $10,200,000. Member banks for this period reported that loans and discounts decreased $35,544,000, investments $18,584,000, net demand deposits $47,719,000 and borrowings from the Federal Reserve banks $16,484,000.

Time money and commercial paper rates were fractionally higher at 3⅞ to 4⅜ per cent and 3¾ to 4¼ per cent, respectively.

Rockelman is Named Ford Sales Manager

Head of D. T. & I. Was Former Branch Manager —Ryan to Take Rest

DETROIT, Oct. 29—F. L. Rockelman, vice-president and general manager of the Detroit, Toledo & Ironton Railroad for the past six years, has been named general sales manager of Ford Motor Co., succeeding W. A. Ryan, resigned.

The new Ford sales manager, one of the youngest executives in the Ford organization, is less than 40 years of age and has been connected with the Ford interests for more than 20 years. He was successively branch manager at Seattle, Buffalo and Indianapolis, leaving the latter city in 1921 to take charge of Henry Ford's railroad.

As head of the Ford railroad enterprises, Mr. Rockelman made an outstanding success. The business experience which Mr. Rockelman gained as head of the railroad, plus the knowledge of dealer problems which he obtained in his earlier days as branch manager, is taken to equip him well for the task of merchandising the new Ford car.

The resignation of W. A. Ryan as general sales manager came as a surprise to the industry. Mr. Ryan had been associated with the company for 19 years, coming to Ford from Flint, where he had been identified with Buick Motor Co. Mr. Ryan says he intends to take a much needed rest.

Brooks Visits Dealers in 5000-Mile Plane Trip

INDIANAPOLIS, Oct. 31—A 5000-mile airplane tour to Marmon distributors in 26 of the largest cities in the East and South has been started by H. H. Brooks, general sales director of the Marmon Motor Car Co.

The five-passenger Stinson plane, owned by the company and used by President G. M. Williams and other officials during the year, is being used for the tour. It has a cruising speed of 100 miles an hour and Captain J. Nelson Kelly, aeronautical expert of the Marmon company, will be the pilot. Ray J. Barbin, of the Marmon engineering department also will make the tour to confer with the service managers in each city and act as assistant pilot.

The route of the tour leads from Indianapolis to Pittsburgh, Cleveland, Buffalo, Rochester and Albany to Springfield, Mass., and will include nearly every city of importance from Portland, Me., to Miami, with Boston, New York, Philadelphia, Baltimore and Washington holding important places in the itinerary.

Along the southern seaboard Mr. Brooks will visit Mobile, Atlanta and Birmingham and will return by way of Nashville, Louisville and Cincinnati.

2,797,840 Motorists Visit Parks in 1927

WASHINGTON, Nov. 3—A total of 2,797,840 persons, traveling by automobiles, visited the national parks of the United States during the year ending Sept. 30, according to statistics of the National Park Service, Department of Interior. This number was 282,000 more than the number of visitors last year.

Jennings Takes Over Paige in New York

NEW YORK, Nov. 1—Two major changes in the metropolitan trade became effective today. C. H. Jennings, Inc., formerly Dodge Brothers dealer in Manhattan, Bronx and Westchester county, takes on the merchandising of the Paige line, while Bishop, McCormick & Bishop, of Brooklyn and Queens, extends its Dodge representation to cover the entire Greater New York area.

Mr. Jenning's new affiliation brings him into association with the Paige-Detroit Co. of New York, which will continue to control wholesale distribution throughout a wide territory, including New York City and the surrounding counties, Long Island and other parts of New York State, Connecticut and New Jersey. He is taking over the Paige showroom at Broadway and 56th St., and retaining several of his former salesrooms and service stations in the metropolitan district.

Bishop, McCormick & Bishop are taking over the Dodge salesroom at 1763 Broadway and is extending a network of other sales and service stations, some new, some previously established, over the territory.

Olds to Add Research Unit

LANSING, Oct. 29—The Olds Motor Works, which is now busily engaged in making a $3,000,000 expansion, has also decided to erect a new building which will be used exclusively for engineering and research work. The engineering building will be 400 by 90 ft. and will contain 36,000 sq. ft. of floor space. A number of dynamometers and other engineering equipment will be installed and the new unit will be ready soon after the first of the year.

Service School Reopens

DETROIT, Oct. 29—The Chrysler Sales Corp. has just notified its dealer organization that the Chrysler service school is about to reopen its classes at the factory. The school is beginning its second year of activity. The course is designed for Chrysler service managers, shop superintendents and service field men, and its facilities are also available to all distributors and dealers.

Michigan Sales Show 25 Per Cent Decline

September Total 11,678 Against 19,354—Nine Months Business Totals 123,556

DETROIT, Oct. 29—New passenger cars titled in Michigan in September totaled 11,678 units, compared with 19,354 units during the same month last year, according to figures compiled by the Michigan Automotive Trade Association. This brings total registrations for the first nine months of the year to 123,556 compared with 166,677 for the same period in 1926. The large part of this loss, however, can be traced to the continued inactivity of the Ford Motor Co. The figures reveal that there were only 14,860 Fords registered this year compared with 55,807 for the first nine months of 1926.

New Jersey Sales 7595

NEW YORK, Oct. 29—Passenger car sales in New Jersey have been holding up rather better than in some other parts of the country. Total number of cars sold in the state in September this year was 7595, according to Sherlock & Arnold. This compares with 9729 cars in August and 8363 in September last year. Commercial car sales were 1072 in September, a rather sharp drop from the September figure last year, when 1599 commercial vehicles were sold.

Graham Truck Shipments Reach Record for Year

DETROIT, Oct. 29—For the two weeks' period ended Oct. 22 a total of 2969 Graham Brothers trucks were shipped to dealers on customers' orders. This is the largest two weeks' period for Graham Brothers this year. While production in the plants at Detroit, Evansville, Stockton and Toronto have been increased several times in the last two months, orders have kept pace and those now on hand total more than 2500.

Advance schedules indicate that the number of Graham Brothers trucks shipped during October will exceed even the big total reached in September, when 5107 vehicles went to dealers on customers' orders. September in turn showed an increase in shipments of 17.2 per cent over August.

Reo Has Best October

LANSING, Nov. 1—Reo Motor Car Co. enjoyed the best October in its history and the month was the third best for all time, declared W. C. Triphagen, general sales manager. It looks like November will carry on, he said. Dealers have fewer new cars than a year ago and used car stocks are on an average with the same period of 1926."

Flowers Deck Office Champion Never Saw

New Building Made Ready After Sailing for Europe—Industry Grieves Passing

FLINT, Oct. 29—Two large baskets of flowers and a wreath rest on a beautiful desk in the new office building of the AC Spark Plug Co. They are the tribute of 3500 workers in the plant to their late beloved president, Albert Champion, who died suddenly in Paris Thursday.

It seems rather odd, perhaps, that Mr. Champion never saw his office. But while he was away the new building was rushed to completion and all the executives were moved into the new quarters where they planned to greet him on his return. And so it seems that Albert Champion's last memories of the great industry he built, will be the modest office across the street, where he closed up his desk only a month ago to start on the trip from which he was never to return.

News of Albert Champion's death weighs heavily on this city which in the space of a year has lost two of its outstanding industrial leaders. The other was Harry H. Bassett, president of the Buick Motor Co., who also died in Paris while abroad with a party of General Motors executives.

B. W. deGuichard, vice-president and general manager of the AC Spark Plug Co. and associated with Mr. Champion for more than 25 years, paid this tribute to his close friend and associate: "Mr. Champion's energy was unbounded, unlimited. He was never satisfied to rest on his laurels or accept things as they were. He was always working for greater things. Few persons knew that the organization under the direct leadership of Mr. Champion had a staff of research and development engineers without a superior in the entire industry, and that these engineers worked on the problems of the industry as a whole.

"We will miss Mr. Champion. The industry and his friends were shocked at his death and will miss him. His death is a tremendous loss.

"We know what his aims and ideals were, and the organization will carry on under the inspiration of our late and beloved leader."

E. T. Strong, president and general manager of the Buick Motor Co., whose factories adjoin those of the AC company said: "I am very shocked and grieved to hear of Albert Champion's sudden death. He was without doubt one of Flint's outstanding industrial leaders, and his passing away is a huge loss to the entire community."

Sloan Expresses Keen Loss

Alfred P. Sloan, Jr., president of General Motors Corp., paid the following tribute to Mr. Champion:

"In my opinion Albert Champion was a most unusual man.

Albert Champion

"After moving to the United States from his native Paris, through sheer ability and the hardest kind of work, he developed into an important executive of General Motors.

"Mr. Champion's loss will be keenly felt, not only in the spark plug company, but throughout the General Motors organization as well as in the automotive industry at home and abroad."

Death Due to Embolism

DETROIT, Oct. 29—Albert Champion, founder and president of the AC Spark Plug Co. and one of the outstanding figures in the automotive industry, died suddenly in Paris, Oct. 27. His death, a great shock to his large host of friends and business associates, occurred in the Ste. Maurice Hotel where he had gone with Mrs. Champion to be a guest at a banquet which had been arranged in his honor by 20 friends. Mr. and Mrs. Champion had just entered the banquet hall when he collapsed. He died a few moments later in the arms of Pierre Tournier, a business associate. Physicians said death was due to an embolism.

With Mrs. Champion he sailed from New York, Oct. 1, on one of his periodic visits to his native land. He had gone to attend the automobile shows and also to inspect his new factory which was completed in Paris during the last summer. When he left he appeared to be in the best of health though advices from Paris state that he complained of illness on the day before his death.

Besides his widow, he is survived by two brothers, Prosper, of Flint, and Lewis, of New York.

Services in Paris

DETROIT, Nov. 1—Funeral services for Albert Champion will be held in the American Church in Paris, Nov. 3. Mrs. Champion will return to America next week and will examine his will to determine where he desired to be buried. She will then return to France and carry out his wishes. In the meantime the body will remain in the mortuary chapel of the church.

Paris Show Attracts 700,000 Attendance

Number of Foreign Visitors Declared Very Large—U. S. Car Sale Heavy

PARIS, Oct. 21 (*by mail*)—Seven hundred thousand persons are declared to have paid admission to the Grand Palais during the 11 days the French automobile show remained open. While opinions regarding the amount of direct business transacted are somewhat varied, there is no doubt about the popular enthusiasm for the show.

The number of foreign visitors was exceptionally big. Germany, admitted officially to the show for the first time this year, and represented by two firms —Mercedes-Benz and Horch—sent buyers, technical experts and newspaper men in large numbers. There was not a country in Europe but was represented by big contingents. Buyers from the East, from South Africa and from the various South American countries were prominent. Many American exhibitors found that they made connections with dealers and users of their cars in South American countries.

The 23 American firms having automobile stands in the show appear to have done a satisfactory amount of business. There is every reason to believe that direct sales off the stand, as distinct from dealer contracts were good.

The 23 exhibiting this year will be back. Nash, which is just closing with a distributor organization in France, states that it will be in next year "with all four feet." The date of next year's show has been fixed from Oct. 4 to 14.

G.M. of Canada Launches Dealer Audit Subsidiary

OSHAWA, ONT., Oct. 31—The inauguration of a new subsidiary of General Motors of Canada, Ltd., which will be known as the Motor Accounting Co. of Canada, Ltd., and which will be devoted to installing accounting systems for General Motors dealers and conducting periodical audits, has been announced. The new company has a capitalization of $10,000 and F. B. Coat, formerly assistant treasurer of General Motors of Canada, has been appointed general manager.

The head offices of the company will be in the new office building at present in course of erection here, and branch offices will be opened immediately in Montreal and Winnipeg. Later it is proposed to open additional branches in St. John, N. B., and Vancouver, B. C.

Goodrich Sydney Plant Starts

AKRON, Oct. 29—Production has been started at the new tire manufacturing plant of the Goodyear Tire & Rubber Co., Sydney, Australia. The new Australian unit will have an initial capacity of 1000 tires and tubes daily.

Men of the Industry and What They Are Doing

Tracy to Award Prizes in Big National Contest

Oakland-Pontiac salesmen throughout the country will participate in a "big game hunt" starting Nov. 7, under the direction of W. R. Tracy, vice-president in charge of sales. Salesmen will seek as their quarry merchandise prizes aggregating many thousands of dollars in value. The hunt closes at midnight, Christmas Eve.

The hunt is being conducted on a point system, a certain number of points being awarded to salesmen for every new car delivered and for every used car selling for $200 or more. A minimum of points entitles the salesman to a prize, his choice of awards automatically widening to include higher priced merchandise as his point total increases.

Dealers in each city are putting their organizations against each other and the entire Oakland sales organization in one city is opposing that in a city of similar sizes and the 22 district offices of the company are aligned in a district game drive. The western half of the country, under E. M. Lubeck, is engaging the eastern district under W. B. Saywer in a super-hunt.

Mr. Track is offering a handsomely mounted deer head as the prize for the winning district office.

Arnold Joins G.M. Truck

O. L. Arnold has been appointed vice-president of General Motors Truck Co., a subsidiary of the Yellow Truck & Coach Mfg. Co. Mr. Arnold will direct the sales activities of this division. He terminates a connection of 17 years with Ford Motor Co., and brings to General Motors Truck Co. a wealth of experience, embracing merchandising and branch house operation. At the time of his resignation from Ford he was branch manager and zone supervisor of the Chicago division.

Chrysler Back From Europe

W. P. Chrysler, president of Chrysler Corp., said the company's outlook for foreign business was excellent and that foreign trade now comprises about 15 per cent of the total business, on his return from Europe, Nov. 1.

Pierce-Arrow Names Directors

John R. Simpson, New York, an official of Sinclair Oil Co., and R. B. Flershem, vice-president of the Marine Trust Co., Buffalo, have been elected directors of Pierce-Arrow Motor Car Co.

Mott Back From South America

Charles S. Mott, vice-president of General Motors Corp., arrived in New York Monday aboard the Grace liner Santa Elisa from South America, where he made a tour of General Motors plants and offices.

W. F. Brown is Named Successor to Drake

The appointment of Walter F. Brown, lawyer, of Toledo, as first assistant secretary of commerce, was announced this week by President Coolidge. Mr. Brown will succeed J. Walter Drake, who retired from office on Oct. 12, to reenter the automobile industry.

The new appointee was a member of the law firm of Brown-Hahn & Sanger. He graduated from Harvard in 1894. During 1921 he was chairman of the joint committee on reorganization of government departments.

Kennelley Back With Goodyear

J. X. Kennelley, formerly manager of the advertising department of the Goodyear Tire & Rubber Co. of California, has returned to that position after an absence of four years. E. L. Falls, former manager of the advertising department of the California Goodyear company, will be associated with Mr. Kennelley as field representative of the advertising department.

Frost Named President

Arthur L. Frost has been elected president of the English & Mersick Co., succeeding the late John B. Kennedy. Frederick T. Bradley was named chairman of the board; Carl W. Johnson was named vice-president, and Seymour M. Bradley, was named secretary and treasurer.

Cord Lycoming Chairman

E. L. Cord, president of Auburn Automobile Co. has succeeded J. B. Graham as chairman of the board of Lycoming Mfg. Co., controlling interest in which was recently bought by Auburn. It is planned to double production of Lycoming engines.

Townsend Extends Activity

G. H. Townsend, president of the Moto Meter Co., Inc., has taken over the duties of general manager. J. J. Tobias has been appointed car equipment sales manager with sales headquarters in the General Motors Bldg., Detroit.

Hewitt Joins Velie

D. C. Hewitt has been appointed Minneapolis district representative for Velie Motors Corp. Mr. Hewitt was recently manager of the Omaha branch for Willys-Overland, Inc., and previously had represented Olds Motor Works in the Minneapolis territory.

Lindbergh Retained as Guggenheim Consultant

Col. Charles A. Lindbergh has been retained by the Daniel Guggenheim Fund for the Promotion of Aeronautics, it was announced this week by H. F. Guggenheim, president. In a statement accompanying the announcement, Mr. Guggenheim said that Colonel Lindbergh for the present at least has determined that he will not identify himself with any commercial undertaking.

Under the arrangement Colonel Lindbergh will be free to engage in any activities which in his judgment will promote the cause of aviation. He will become a member and trustee of the fund and his headquarters will be at the fund offices.

Bauer Indian President

At the annual meeting of the Indian Motocycle Co., Louis E. Bauer was elected president and Claude Douthit was made chairman of the board. William E. Gilbert was reelected vice-president and Thomas M. Darrah was elected treasurer to succeed John W. Leahy, who resigned. Reports showed orders and prospects improved over a year ago. It was voted to make the company's fiscal year correspond with the calendar year, instead of starting Sept. 1, as heretofore.

Martin Joins Vlchek

A. L. Martin has been appointed general sales manager of the Vlchek Tool Co., Cleveland, manufacturer of automotive tools and specialties. Mr. Martin was formerly sales manager of General Tire & Rubber Co. The company is planning national distribution of its product. Twelve of the 14 sales zones in which the company has divided the country are now in operation.

GM Export Adds to Staff

General Motors Export Co. has added the following men to its personnel: K. D. Bell, formerly with the Studebaker Corp. of America; C. M. Hartsfield, formerly with Motor Tool Specialty Co., New York City, and R. L. Carlson, formerly with Cadillac Motor Car Co. P. D. Lovett, of the advertising division, has been named advertising manager for General Motors Argentina.

Campbell Auburn Representative

Malcolm Campbell, well known British racing driver, has been appointed London representative of the Auburn Automobile Co.

Weymann Sailing Nov. 11

Charles T. Weymann, president of the Weymann Body Co., will sail from Havre for the United States on Nov. 11.

September Exports Rise to $29,129,619

New Total is Increase of $29,129,619 Over 1926—Average $35,202,834

WASHINGTON, Nov. 3—Automotive exports from the United States during September totaled $29,129,619, an increase of more than $900,000 over the exports of the same month last year, the U. S. Department of Commerce announces. The monthly average of automotive exports for the entire year totals $35,202,834.

Shipments of passenger cars and trucks totaled during the month 26,273 units, the average unit value of passenger cars being $763 and that of trucks $730.

Automobile Clubs Amend Race Weights and Rules

NEW YORK, Nov. 2—The annual general meeting of the International Association of Recognized National Automobile Clubs was held in Paris, Oct. 13, America being represented by W. O. Hogan. In addition to dates being allotted for 56 international sporting events, certain changes were made in the racing rules. The weight limit for the 3-liter class of sport cars was reduced from 2112 to 1892 lb. and such cars must be occupied by at least two persons. In the case of racing cars the weight limit was entirely removed. The Delage firm was officially acknowledged victor in the race for the world championship.

With the object of promoting international touring, it was decided to establish an international touring bureau, which will have its headquarters temporarily in Geneva. The bureau is to work out touring maps, travel guides, etc., and is to keep in constant touch with the automobile clubs of the individual countries regarding changes in regulations and other matters affecting motor tourists.

Three new member clubs were elected at the meeting, the Association of Irish Automobile Clubs, the United Automobile and Sport Club of Greece, and the Automobile Club of Lithuania and Esthonia.

Oakite Calls Convention

NEW YORK, Nov. 2—Oakite Products, Inc., will hold its annual service convention at its general offices here, Nov. 7 to 10, to discuss industrial cleaning and related problems. A paper on Oakite Materials in Automobile Service Stations will be read.

Stutz Establishes Salon

CHICAGO, Oct. 29—Establishment of the Stutz Petit Salon at Rush St. and Walton Place, the heart of the "Gold Coast," is announced this week by F. D. Cerf, president of the Stutz Chicago Factory Branch, Inc. Lester V. Smith will be the managing director of the new showroom. The displays will be exclusively custom-built and each week a different model and type will be presented. A new thought in displays will be effected with the exhibition of a single car at a time. The interior of the showroom has been furnished in studio style and presents a very attractive appearance.

Wickwire Receiver to Fill Commitments

BUFFALO, Nov. 1—The Wickwire Spencer Steel Co., Inc., voluntarily went into receivership Oct. 22. Edward C. Bowers and Charles L. Feldman were appointed receivers. Mr. Bowers was for the past two years president of the corporation and his appointment as active director of affairs is taken to denote confidence in his direction of the company's business and in his ability to carry on to successful termination the present readjustment proceedings. It is expected they will make the company one of the strongest financially in its line of endeavor.

His appointment has insured the retention of the present organization which covers administrative, operation and selling. All the plants will be operated as heretofore without shut-down. Any unfilled commitments on the books of the company will be successfully handled as will future business that is placed with them. There will be no rearrangement of the selling organization in any respect and sales contacts which customers have had will be maintained as in the past.

The American Wire Fabrics Corp., while it is a subsidiary of Wickwire Spencer Steel Co., Inc., is not in the receivership and in no way affected by these proceedings.

American-La France Buys Foamite-Childs Company

NEW YORK, Nov. 2—Effective Nov. 15, the American-La France Fire Engine Co., Inc., will acquire the assets and good will of the Foamite-Childs Corp., Utica, N. Y., and the businesses of the two companies will be combined in a new company named the American-La France & Foamite Corp. Sales and engineering offices will be maintained in all principal cities of the United States and Canada and affiliated companies will operate in foreign countries.

Ecker Forms Company

SYRACUSE, Nov. 1—Ecker Mfg. Co. has been formed here by Herman A. Ecker for the manufacture of shop and garage equipment. Mr. Ecker formerly was with Garage Equipment Mfg. Co. Production for the present is on service jacks, wrecking cranes, trussels, floor lamps, spacer bars, towing devices, oil racks and ambulances. Additional items will be added as experimental work is concluded.

Financial Notes

Mack Trucks, Inc., reports for the three months ended Sept. 30, net profit of $1,425,853, after depreciation and estimated Federal taxes, equivalent to $1.60 a share on common stock. This compares with $1,558,793, or $1.78 a share, in the 1926 quarter. Net for nine months is $5,103,592, equivalent to $5.96 a share, as against $7,289,494, or $9.02 a share, for the same period in 1926. Notes and accounts receivable and inventories have been reduced more than $19,500,000 since the new credit terms went into effect. The company has more than $12,500,000 in cash and marketable securities.

The Caterpillar Tractor Co. reports sales for the third quarter were $7,194,000 with estimated net of $1,795,656. The sales for the third quarter of last year were $4,530,000 and net before taxes $1,061,527. Total sales of the company for the nine months were $21,685,423, as compared with $16,351,982 for the same period of 1926. Total net earnings for the nine months' period were $5,177,796 as compared with $3,812,087 for the same period of last year. Current assets were $15,663,000 with current liabilities of $1,132,000. The company's statement shows cash in bank, certificates and loans of $2,985,323, with no borrowings.

A. O. Smith Corp. stockholders have approved the directors' recommendation to increase the capital structure from 100,000 to 500,000 shares. The increase will be effected through an exchange of one share of the old for five shares of the new stock and will become effective Nov. 16. Dividends declared and payable after Nov. 15 will not be paid to the owners of old certificates until they are presented for exchange.

American Bosch Magneto Corp. reports for nine months ended Sept. 30, profit of $195,314 after expenses and depreciation but before Federal taxes, against profit of $244,143 in first nine months of 1926. Profit for the September quarter was $114,848, before Federal taxes, comparing with profit of $37,684 in the preceding quarter and $391 in third quarter of 1926.

Curtiss Aeroplane & Motor Co., Inc., reports profit for the six months ended June 30, after all charges but before Federal taxes, $332,252. Net profit for the full 1926 year was $413,317 after taxes. Balance sheet on June 30 shows total assets of $4,887,743 against $4,585,635 on December 31, 1926.

Wright Aeronautical Corp. earned $2.59 a share in nine months of 1927, against $1.82 in the same period of 1926. Net profit rose to $648,616 from $454,924. The third quarter earnings were equal to $1.17 a share, against 52 cents a share in the third quarter last year.

Chrysler Adds Coupe

DETROIT, Oct. 31—Chrysler Corp. has added a de luxe coupe with rumble seat to its "52" line, priced at $795. The front compartment is trimmed in gray shark-grained leather with cushion springs of saddle type. The rumble seat is trimmed in moleskin imitation leather. The finish is in several color combinations.

Sales Dip Lower in Most Centers

(Continued from page 698)

selling of displaced models in some lines has created some slight complication in the new car field in a number of cities. Used cars selling at about the expected price of the new Ford have found the greatest buying resistance, much better movement being reported of rebuilt cars selling at higher levels.

BOSTON

With but two months remaining for 1927, motor car dealers are in a much better frame of mind. October began a bit slowly, but then sales took a spurt after the first 10 days and went along evenly throughout the month. New car stocks are not heavy. In fact some of the dealers could sell more cars if they could get additional shipments of certain models that have special appeal. Factories are not crowding the dealers, and with meetings more frequently addressed by factory men the salesmen and sub-dealers are kept pepped up. Used car stocks are not moving very fast but on the other hand they are not accumulating to any great extent. Both new and used cars on hand at present are from 15 to 20 per cent less than for the same period of 1926. Dealers are going into November with more enthusiasm.

NEW YORK

Automobile sales were on a fairly good level in the early weeks of October, due to a considerable extent, to forced selling at unusual discounts of leftover models in several lines. Actual sales in the first two weeks were 3926 cars, according to Sherlock & Arnold, which compares with 3096 in the corresponding period in October, 1926. Total sales for September this year were 8587 units. The sales of obsolete models naturally created unusual difficulties in moving used cars. This situation was aggravated by forced selling of used cars by one dealer who is discontinuing his present business. With these unusual conditions fairly well cleared up, the outlook is better than it has been for some time.

ATLANTA

Though it can hardly be said that October established a record for automotive sales in the Southeast, business is reported satisfactory, with the outlook for the rest of the year excellent. Chevrolet had the largest Chevrolet month in the history of the Southeast. Some medium-priced cars report a good gain in sales over last year. Business is especially good in rural communities. Higher priced cars also report business in October better than last year. In the truck field another substantial gain in sales was noted during October, and because of the general excellence of business in this district, truck sales promise to continue gaining steadily. Used car business is better than last year, but improvement in new car sales has increased dealer stocks of used vehicles.

CINCINNATI

Automobile sales have slowed up considerably. Actual registrations up to Oct. 28, inclusive, were 200 behind the same period last year on new cars and approximately 100 behind last year on used cars. A few dealers report business good and the outlook good for November. Actual figures among 16 of these dealers reveal an inventory of 1090 used cars in stock as of Oct. 28 against 977 on hand on the same date last year. All the dealers have heavy inventories of new cars and in five or six specific instances they are moving at a good rate. In the cases of the others the slump is being felt keenly, particularly so in the lower priced field. While general business conditions are good and the weather all that could be asked, dealers can assign no reason for the slow-up other than Ford propaganda. This is affecting all cars up to the $1,000 class seriously.

DETROIT

New car sales in Wayne county during October have been unusually light. This condition has also prevailed throughout Michigan, though not to the degree as noted in Detroit. A survey indicates that new car stocks in dealers' hands are not large. There appears to be a large number of used cars on hand at the present time, though the situation is reported to be not as bad as a year ago at this time. Dealers have been mindful of the advent of the new Ford, according to reports, and have made it a point to keep used car stocks well liquidated.

CLEVELAND

Regardless of optimistic notes struck in the past month by dealers and Cleveland industrial figures, automotive sales continue lower. There were 1671 new cars sold, compared with 1889 for September, and 2278 for October, 1926. Used car figures also dropped with 8078 cars against 8577 for September and 8546 for October, 1926. Only a few dealers are optimistic for November and December. Chevrolet men report a good volume of business for October, but they are the exceptions rather than the rule. Stocks on hand are normal, no overloading, but little is taken on. The keynote for loosening the situation lies in the hope that people will forget the Ford delay and start spending their money, according to a census taken among dealers.

NEW ORLEANS

A survey of the automotive situation in New Orleans, for the month of October, indicates a slight drop in the sale of new cars over the same period last year. Two factors are responsible for this condition: First, this locality has not recovered fully from the depression that has followed as a result of the flood, and second, the suspense that the market is held in on account of the new model Ford automobiles, which are expected now at any time.

CHICAGO

Automobile sales showed approximately a 10 per cent increase over September and 15 per cent over October of last year. Volume, however, probably was not greater than either September of this year or October of last and in some cases it was less. Automobiles in the lower price brackets showed marked increases, one company reporting 30 per cent more business than September and 80 per cent more than October of 1926. On the other hand, two well known medium priced cars found business no better and one of them reported a distinct slump. Used cars sold at a fair pace and stocks are about 3 per cent lower than a year ago. As for the last three or four months, the stock of used Fords was nil and in many cases dealers advertised for used Fords, by the sale of which they might keep their staffs busy and make some profit. New car stocks were slightly higher. No overloading was evident, however.

MILWAUKEE

October has been somewhat of a disappointment to most dealers. The medium-priced cars have held fairly close to the level of the same month a year ago, but low-priced cars have lost considerable ground. There seems to be no question that the delay in the Ford announcement has slowed up trade. New car stocks in dealers' hands are somewhat larger than a month ago, but are hardly as large as a year ago. Used cars are in great accumulation despite strenuous efforts to move them into channels that might be in the Ford market. The dealers' salvage corporation is junking a considerable number of cars, but the impression on total stocks naturally is relatively insignificant. Most dealers express the belief that a turn in the situation may be expected when the new Ford is made public.

ST. LOUIS

Automobile sales during October were under those of the previous month and about 10 per cent below those of October, last year. Many prospects are still deferring their purchases awaiting the arrival of the new Ford and it is likely that these purchases will not now be made until spring. Owners are spending more money making their cars serviceable for winter driving than is usually the case, which is reflected in the increase of business in parts and repairs. Cars in the low price class show the greatest losses in sales. Demand for trucks, especially the light duty variety, is good.

KANSAS CITY

October sales in both new and used cars have been good in Kansas City. Ideal weather conditions have been a factor especially in used car sales. Most of the leading dealers report gains for the month over September. Used car stocks in the hands of dealers are lower than last year. Few dealers here have more than a normal stock of new cars on hand, with several companies reporting sales slowed down by not being able to obtain cars to fill orders.

DALLAS

The automotive business in Texas and parts of Oklahoma, Louisiana, New Mexico and Arizona showed slight improvement during October, but actual sales were less

Farm Districts Increase Truck Buying

than for the same month a year ago. Business for the first 10 months is considerably under that of the same period last year. Dealers anticipate better trade for next 60 days. Delay of new Ford model still hampering sales. Stocks of new and used cars seem heavier than usual at this season. New car sales slightly above those of September and 10 per cent lower than for October a year ago. Stocks heavier than usual at this season of year. Used car sales little above those of September but considerably less than October a year ago. Truck sales better in both city and rural districts. Dealers not heavily stocked. Money is plentiful and the general business situation in the district is good.

MINNEAPOLIS

The outlook for the automobile business in the Northwest is for moderate sales through the winter and better sales in the spring. Stocks of new cars are lower than a year ago and than in September. The purchasing power of the farmer is increasing through rapid marketing of grains at terminals. In turn the wholesale and retail firms are clearing up their indebtedness with the banks and the banks with their correspondents in the cities. This is clearing the situation as a whole. The used car situation is not comforting, as there are larger stocks than are being absorbed.

DENVER

October has been a disappointment in car sales. This is particularly true of smaller cars. Mediums run about the same as this time last year, and high priced cars are, if anything, a little better. Collections are very slow, with a large number of repossessions. The light truck field is more encouraging, as is usually true at this time of the year, due to a reasonably good beet harvest. People are awaiting the appearance of the new Fords before buying light cars. Used cars are more in demand than new ones, and there has been a little increase in this line. Throughout the state crop marketing is going ahead with the most favorable weather conditions imaginable. Dealers are optimistic over November prospects.

SAN FRANCISCO

Passenger car sales for October, for which estimates only are available, are believed to be about the same as for September, with Chevrolet and Buick leading their respective fields. New car stocks are low, with Ford salesrooms virtually empty. Used car stocks are heavy, and in many instances double those of the same date in 1926. Movement of used cars, except those rebuilt and guaranteed, notably Buicks, Cadillacs and Chryslers, is slower than at any time this year, especially in low-priced classes, where prospects appear to be waiting for new Ford. Regular fall buying of trucks made sales generally better for October than for September, and considerably above preceding months of this year.

SEATTLE

New car sales continue to be less than a year ago in Seattle and the Pacific Northwest, in fact various towns are reporting total sales 30 to 40 per cent under a year ago. Dealers are carrying small stocks and making quick deliveries on all orders. The used car market is not unduly heavy. Stocks of new and used cars in the hands of dealers are less than a year ago. The whole outlook for November is fair in the cities and splendid in the agricultural sections where the wheat and apple farmers have had a great year. Demand for trucks is increasing a little bit as the lumber industry is showing up a little better.

LOS ANGELES

Total Southern California October sales are somewhat under those of October last year and slightly under last month. New car stocks in dealers' hands are slightly more than they were the same month last year, while used car stocks are less. General business conditions are not up to expectations, but betterment is expected in November. The truck market is decidedly off, running considerably under October, last year. Used trucks are moving fairly well.

War Department Finds Light Trucks Preferable

WASHINGTON, Nov. 3—A series of tests just made by the War Department to determine whether a light or a heavy automobile truck is more adaptable for army use, has resulted in an announcement that the light truck is preferable.

Tests made over a period of several days, showed that with a light vehicle troops could be moved an average of 180 miles per day. At another point troops were moved an average of 100 miles per day with a light vehicle. In using heavier trucks the movement was slowed down from 25 to 35 miles per day, the tests showed.

For future needs it was recommended, as a result of the tests, that efforts be made to secure a heavy truck "which has both greater speed and tractive power." Light trucks, it was found, while possessing greater speed, were handicapped in moving 3-in. guns.

Cuban Tariff Cut 20%

WASHINGTON, Nov. 2—An analysis of the new Cuban tariffs which became effective on Oct. 26, as they pertain to the automobile industry, shows "the duties on passenger cars and motorcycles are decreased by 20 per cent from the former rates. Tires and tubes which were formerly dutiable ad valorem at the same rate as automobiles, are given a specific duty in the case of pneumatic tires and inner tubes, while the ad valorem rate which is continued on solid and perforated tires amounts to only one-half that previously levied."

German Cars Show 29.7 Per Cent Gain

Truck Registration Shows 22 Per Cent Increase—American Car Outlook Good

WASHINGTON, Nov. 2 — Registration of motor vehicles in Germany during the year ending July 1, this year, showed an increase of 34.5 per cent over the previous year, the automotive division of the Department of Commerce is advised by its representative in Berlin. Registration of motorcycles, as of July 1, this year was 339,226, an increase of 43.5 per cent; passenger car registration was 267,774, an increase of 29.7 per cent and truck registration was 109,861—an increase of 22 per cent, or a mean average of 34.5 per cent for all classes.

The prospects for the sale of American automobiles during the coming year is regarded as exceedingly good. Assembly of American cars is increasing.

Sell 135,000 Reo Shares, to Enlarge Directorate

LANSING, Oct. 29—The State Securities Commission has given its approval to the sale of 135,000 shares of Reo Motor Car Co. stock. The stock at present stands in the name of R. E. Olds, chairman of the board of directors.

In a statement Mr. Olds declared that was no significance in his listing the stock for sale, asserting that his action was taken in behalf of other stockholders whose shares he held as trustee. He did comment, however, that at the next annual meeting of the company to be held in December, that "the board might be enlarged a little."

The stock has been listed with Keane, Higbie & Co., Detroit brokers, who are also understood to have options on additional blocks of Reo stock. Application has also been made to list the stock on the New York Stock Exchange and decision in the matter now rests with the board of governors.

Territories Increase Cars

WASHINGTON, Oct. 29—Exports of automobiles and trucks to Alaska, Hawaii and Porto Rico, non-contiguous territories of the United States, increased 287 per cent in 1926 compared with 1921, the Department of Commerce announces. In 1926 a total of 2293 passenger cars, valued at $1,977,762 were imported into Porto Rico; 4257, valued at $3,293,475 were imported into Hawaii, and 412, valued at $341,652, imported into Alaska.

Automotive Buyers Help Steel Outlook

More Cheerful Sentiment Follows Buying Activity—Plans for Mergers Continue

NEW YORK, Nov. 3—Automotive consumers have figured somewhat more prominently as buyers in the steel market in the last few days and in consequence sentiment among producers has turned a shade more cheerful. Complaints that prices for sheets and some other steel descriptions are inadequate, continue, however, as loud as ever. It is becoming more and more apparent that in most mills further production economies can only be attained by a downward revision of wage scales and leading interests are reluctant to have the responsibility for initiating such a move saddled upon the steel industry.

While plans for mergers continue and their consummation may eliminate some surplus competition, it is inconceivable that the market's structure can for any length of time be altered in an upward direction until consumption has caught up with the greatly enlarged capacity.

Efforts continue to make small lot buyers pay the proportionately greater cost which the filling of such orders involves. Cold finished steel bar manufacturers recently issued a new card of extras, chiefly designed to set up new quantity differentials, so that orders for less than three net tons of any one size bars need no longer be handled at a loss which finishers claim resulted under the schedule formerly in vogue. This small lot business, if the new list of extras is maintained by all finishers, will now go to warehouse jobbers. Incidentally extras on hexagons from 11/16-in. to 1 7/16 in. have been lowered.

In sales of material that carry large extras, black sheet prices have been figured down to as low as 2.75 cents, Pittsburgh, but the market as a whole rules $2 @ $3 per ton higher. Full-finished automobile sheets hold steady at 4.15 cents, Pittsburgh.

There is much talk about Ford buying beginning to make itself felt, but so far there is no indication of any representative tonnage orders having been placed, although some inquiries from parts makers are thought to have been prompted by the Ford Motor Co.'s purchasing organization shopping around for lowest prices.

Pig Iron—Automotive foundry demand runs light, consisting largely of small lots to fill in. The market is easy, with No. 2 foundry quoted at $17.50, Valley. Recent price reductions in the Chicago and Cleveland markets have not been followed by greater interest on the part of consumers.

Aluminum—Importers' prices have so far taken no definite shape, but since announcement of the 1 cent per pound reduction in the domestic producer's ingot prices, imported 98 @ 99 per cent metal has been offered for resale by second hands at 24.30 cents, 70 points below the leading interest's new price.

Copper—With the demand for automotive brasses and other copper and brass products rather light, rolling mills show no great eagerness to anticipate their needs of metal. The market continues at about unchanged levels and easy.

Tin—The market is irregular and declines are more frequent than advances, with the result that spot Straits is available at around 57¾ cents.

Lead—A slightly firmer undertone is in evidence, foreign cables indicating a turn for the better. Storage battery manufacturers appear to be still fairly well covered.

Zinc—Producers pin their faith in improvement of the market on reports that mine owners are contemplating curtailment of ore output.

Industry Increases Orders for Hardwood

ATLANTA, Nov. 1—Automobile and body industries have continued to place orders on an active basis the last two weeks with lumber manufacturers in the Southeast. The larger car, truck and body builders are buying for advance requirements, mainly for the first quarter of 1928, and their orders are large.

Delivery will be made during the early part of the coming year for the most part, and it is further stated that indications at present are that the industry will buy for needs during the first quarter of 1928 on about a 10 per cent larger basis than for the first quarter of 1927.

The heaviest demand is for the best grade of ash in the wider dimensions, with a good demand also reported for No. 1 and select ash and the best grade of maple in the wider sizes, and some orders for the best grades of elm. Prices are considerably lower than they were at the peak reached following the Mississippi floods early this year, but are now showing a tendency to advance.

Rubber Market Firmer

NEW YORK, Oct. 31—There is a somewhat firmer tone to the rubber market, attributed to the introduction in the Malayan legislative council of a bill designed to tighten the restrictions of the Stevenson Act.

The bill would tend to restrict the carrying over of rights to export rubber from quarter to quarter. If in any particular restriction quarter the quantity exported by an estate should fall short of the authorized total, the balance might be exported in the following quarter, if and when the full amount authorized for that quarter has been exported.

The law would become effective after Feb. 2, 1928.

Watson Sales Double

PHILADELPHIA, Oct. 31—John Warren Watson Co. reports an increase in September sales of 95 to 100 per cent following the introduction of its new Type AA stabilator about Sept. 10. Sales in Cleveland showed an increase of almost 500 per cent.

Ford News Describes New Plant Equipment

Many Departments Rearranged to Make Increased Efficiency in Production

DETROIT, Nov. 1—According to the latest issue of the *Ford News*, Ford plant organ, the Fordson factory is humming with activity in preparation for the new car. New production machinery is being built, assembly and parts conveyors are being rearranged to meet the requirements on the new production program and, it is intimated, new attainments in production methods will be achieved when actual production operations begin.

Some 230 engineers and their assistants have been engaged in designing new production machinery with the result that very important improvements have been made on usual production practice. One of the most interesting developments is that of hot metal spinning machines in which disks of hot metal are placed between vertical rotating dies and transformed in area and shape within a few seconds.

Some mammoth presses have been installed, the largest pair weighing 480,000 lb. each and being over 30 ft. high. Other presses are even higher than this but weigh less. The new presses are placed in pits.

Developments have been made in welding machinery, particularly with butt, seam and spot welding equipment which are expected to play a large part in the new production program. Departments have been relocated strategically to provide still better progression of manufacture. For example, in the steel mill several manufacturing departments have been placed where they will receive stock direct from the cooling beds of the rolling mills and so will leave the steel mill in the final form needed at the assembly line.

Assembly Lines Joined

The main assembly line has been joined to the engine assembly line. Body assembly has undergone important changes. Separate lines for various styles of bodies have been superseded by a plan whereby a single line is required for all types.

Another furnace of 200 tons daily capacity has been placed in operation at the open hearth department in addition to the four already in action and three more are under construction. Four of the furnaces now operating are of the tilting type while the latest is stationary.

Of the eight turbo-generators for which provision has been made four have been installed in the main power house making available 250,000 hp. The new open hearth building is 1066 x 240 ft. and there are about 16,180 lights of window glass each 5 ft. by 2 ft. in its roof monitors and walls. The charging floor contains about a mile of railroad track.

DuPonts Back New Bellanca Enterprise

Formation of New Airplane Company With Delaware Factory Under Way

WILMINGTON, Nov. 1—Formation of a company to build Bellanca airplanes is under way here and formal announcement is expected within a short time. The company will have the backing of several members of the duPont family though it will not be identified with the E. I. duPont de Nemours & Co., Inc.

Under the arrangements, Giuseppe M. Bellanca, who designed the plane in which Chamberlin and Levine flew to Germany, will move from his rented factory on Staten Island, N. Y., to a site on the Delaware River suitable alike for building land and seaplanes and only 15 minutes away from Wilmington.

Henry Belin duPont, who, with other members of the duPont family is interested in the Bellanca factory, said today: "Several members of the duPont family are interested, but not the company." Asked who was interested besides himself and Frank V. duPont, son of United States Senator Coleman duPont, whose name has been mentioned, his reply was: "Well, I don't know just who. Maybe several members of the family. The project has not progressed far enough," he explained, "to make any definite statement. The company has not even been formed."

"Just what has been done and what are the plans?" he was asked. "What we have done is to obtain an agreement with Mr. Bellanca for his services and secure an option on a proposed site for a plant. This site is just south of New Castle, Del., six miles south of Wilmington, on the Delaware River, suitable for land and seaplane construction." Mr. duPont said he did not know when the company would be incorporated, but expected it would be within two or three weeks.

"Will you take an active interest in the project after the company has been formed?" he was asked. "Only as a stockholder," was the reply.

Railroads Running Buses at Loss, Say Operators

SALEM, ORE., Oct. 29—Two companies operating in Oregon have appealed to the Public Service Commission to cancel permits granted to railroads to operate stages, charging that the railroads have been running buses at a loss to stifle competition. The complaint also charges that use of railroad funds to operate stages is in violation of the Transportation Act of 1920.

The Columbia Gorge Motor Coach System and the Oregon Stages are complainants.

French Registrations Below Former Year

PARIS, Oct. 18 (*by mail*)—An increase of 83,613 automobiles during the year 1926 is shown by French registrations just issued. This gives a total number of automobiles, exclusive of motorcycles, of 834,449. The increase is lower than for any year since 1922, and is far short of 1925, which showed the record increase of 152,875. These government returns are practically one year old, and if consideration is taken of the increase during 1927, the total number of automobiles in France at the present time, motorcycles included, is about 1,060,000. Direct taxes paid by French automobiles during 1926 amount to 464,956,362 francs or an average of 477 francs per car.

Austin Plans Production of 70,000 in Coming Year

LONDON, Oct. 19 (*by mail*)—At a gathering of Austin dealers this week Sir Herbert Austin said that, in spite of the difficulties caused by the aftermath of the 1926 coal strike, the sales of Austin cars during the past 12 months showed an increase of 41 per cent over the previous year, and that the production schedule for the next 12 months would be for another 100 per cent increase representing an output of 70,000 cars. During the past year the export trade had increased by 39 per cent, and reports from overseas promised a 100 per cent increase in demand over 1926-27.

Sir Herbert also stated that the production of the 7 hp. model by the German concern which had acquired the manufacturing rights had reached a stage that would result in deliveries commencing in November, while he was also expecting to make arrangements for the production of this car in France as well as in U.S.A.

Equip Detroit Engine Plant

DETROIT, Nov. 1—Detroit Aircraft Engine Works has leased a new plant here and is equipping it for an anticipated production of 3000 engines of the five-cylinder 60 hp. type in 1928. The company also is developing three-cylinder and seven-cylinder engines on the same crankcase as well as a nine-cylinder model. All are air-cooled radials.

Prudden Starts Plane

SAN DIEGO, CAL., Oct. 31—The Prudden-San Diego Airplane Co., which was organized last May, is now ready to go into production on its first type ship, an all-metal seven-place cabin-type transport of the tri-engine type.

Warner Cites Need for Overseas Flying

Sees Intense Competition for International Air Routes in Future

DETROIT, Oct. 29—Development of overseas air trade is of much greater importance at present than domestic air commerce, stated E. P. Warner, assistant secretary of the Navy for Aeronautics, at a luncheon given in his honor by the Detroit Chamber of Commerce and local aviation enthusiasts this week.

In conjunction with this statement Mr. Warner emphasized that the flying boat and rigid airship have been entirely too much neglected in view of their value to commercial aviation. "Both flying boats and rigid airships are given the greatest promise for both foreign and domestic air commerce," stated Mr. Warner. As a few examples he gave the Detroit-Cleveland Air Line, Buffalo to Toronto, Hawaii inter-island communication and trade to the Central American countries and West Indies, including Panama, as requiring flying boats for their most successful development.

"Neglect to develop domestic air commerce at the worst may mean inconvenience," continued Mr. Warner, "but since by law it is restricted to American nationals there is no danger of foreign competition. On the other hand international air commerce will undoubtedly be highly competitive in the future and it is up to American commercial transport organizations to get a good start in this field, to be able to meet competition as it arises. Foreign air lines to Buenos Aires and other South American cities, which have been projected to expedite communication with Europe, will have the effect of bringing these countries closer to Europe than to the United States which unless actively and immediately met by lines of communication to the United States may seriously affect commerce with South America."

Naval Efficiency Increased

Mr. Warner stated that the five-year naval aviation program which is intended to provide 1000 airplanes of modern types for active use in conjunction with naval operations, had now reached the point where the Navy has 1000 planes of which 500 to 600 are of sufficiently modern design to be used in time of war. Mr. Warner also expressed great confidence in the future of the rigid airship in commercial air transport.

Among those present at the luncheon and introduced by the toastmaster, Edward S. Evans, were F. J. Haynes, chairman of the board of Dodge Brothers, Inc.; W. B. Mayo, chief engineer of Ford Motor Co., and L. M. Woolson and Brodie of the Packard Motor Car Company.

1926 Export Total Revised to 305,528

WASHINGTON, Nov. 2—Exports of automobiles from the United States during 1926, according to revised figures just announced by the U. S. Bureau of Statistics, totaled 305,528 passenger cars and trucks, having an aggregate value of $223,763,952. The revised figures of the parts and vehicles, not included in passenger cars and trucks, show that the total was $115,327,106. Motorcycles exported totaled 22,670, valued at $4,915,940.

Revised import figures for the year show 813 cars and trucks imported, valued at $1,352,984, while parts were valued at $810,188.

New Velie Model $1,115, Exports Increase 141%

MOLINE, Oct. 29—A new two-door sedan with an adjustable driver's seat is announced this week by Velie Motors Corp. The new sedan is an addition to the standard six line of 112 in. wheelbase and is priced at $1,115. It is equipped with front bumpers, rear bumperettes, cowl ventilator, automatic windshield wiper, rear vision mirror, stop light, spare tire, tube and cover and radiator emblem.

The company reports an increase of 141 per cent in export sales in the first nine months of 1927.

Builds Trucks in Poland

WASHINGTON, Oct. 29—The organization of a new automobile manufacturing concern in Warsaw, Poland, is reported to the automotive division of the U. S. Department of Commerce. It is known as the "Ursus" Automobile Mfg. Co. Mass production starts Nov. 1.

Coming Feature Issues of Chilton Class Journal Publications

Nov. 10—Marketing Annual—Motor World Wholesale

Feb. 18—Statistical Issue—Automotive Industries

Jan. 1—National Shows Number—Automobile Trade Journal.

Jan. 5—National Shows Issue—Motor Age.

Excise Tax Collection Declines to $5,366,671

WASHINGTON, Oct. 29—Collection of excise taxes from the automobile industry during September totaled $5,366,671 and represented a decrease of $1,771,262 from the total of $7,137,934 collected in September last year, according to figures announced by the U. S. Bureau of Internal Revenue.

The total automotive excise tax collected thus far this year from the beginning of the fiscal year (July 1) totals $16,588,043, compared with $19,232,883, collected the same period of 1926.

Tatra Car Oversold

WASHINGTON, Oct. 29—The Tatra automobile, manufactured in Czechoslovakia, is reported by the American consul at Prague enjoying unprecedented business, its entire stock being sold and present orders being taken only on six weeks delivery. The company's six-cylinder car cannot be delivered less than three months after the orders, the Department of Commerce is advised.

See U.S. Stock Cars in European Races

PARIS, Oct. 21 (*by mail*)—At the distribution of prizes in connection with the Rudge Whitworth 24-hour road race, run at Le Mans last June, it was announced that next year's event would be held on similar lines for stock cars. The awards will be annually, instead of biannually, the cup being won on formula designed to give equal chances to all cars, and in addition a special cash prize being offered for the greatest distance covered. A subscription list for this cash prize has been opened, the Rudge Whitworth Co. heading it with 10,000 francs. It is understood that American cars will compete next year.

Among the changes in the rules will be the abolition of the regulation requiring the first 200 miles to be covered with tops up. It is stated that tops are now satisfactory, and consequently there is no reason for continuing this test. A number of supercharged cars now being on the market, it is proposed to admit them in competition with non-supercharged models. Commercial gasoline, supplied by the organizers, will have to be used. The Rudge Whitworth 24-hour road race has secured a position as the most important stock car event in Europe.

Borg & Beck Shows Gain

CHICAGO, Oct. 29—Borg & Beck Co. reports for nine months ended Sept. 30, 1927, net profit of $770,761 after charges and Federal taxes, equivalent to ($6.70) a share (par $10) earned on outstanding 115,000 shares of stock, compared with $630,948, or $5.04 a share on the 125,000 shares outstanding in first nine months of 1926.

Calendar of Coming Events

SHOWS

All Western Road Show, Los Angeles, March 7-11
American Road Builders Association, Public Auditorium, Cleveland..Jan. 9-13
Argentine .....Nov. 10-20
Automotive Accessories Association, Armory, Chicago .....Nov. 7-12
Automotive Equipment Association, Coliseum, Chicago .....Nov. 7-12
Berlin, Exhibition of Engineering Materials .....Oct. 22-Nov. 13
*Boston, Mechanics Bldg.....March 10-17
*Chicago, National Automobile Chamber of Commerce, Coliseum, Jan. 28-Feb. 4
Glasgow .....Nov. 4-12
International Aircraft Show, Berlin, March 23-April 11
Lille, France, Exposition....Nov. 20-Dec. 4
London Truck Show .....Nov. 17-26
Montevidio .....Nov. 19-27
National Standard Parts Association, Convention Hall, Cleveland..Nov. 14-18
*New York, National Automobile Chamber of Commerce, Grand Central Palace .....Jan. 7-14
Rio de Janeiro .....May 3-13
Salon, Automobile Salon, Inc., Hotel Drake, Chicago .....Jan. 28-Feb. 4
Salon, Automobile Salon, Inc., Hotel Biltmore, Los Angeles .....Feb. 11-18
Salon, Automobile Salon, Inc., Hotel Commodore, New York..Nov. 27-Dec. 3
Salon, Automobile Salon, Inc., Palace Hotel, San Francisco..Feb. 25-March 3
United States Good Roads Show, Des Moines .....May 28-June 1

*Will have special shop equipment exhibit.

CONVENTIONS

American Road Builders' Assn., Hotel Hollenden, Cléveland .....Jan. 9-13
American Road Builders' Association, Banquet, Hollenden Hotel, Cleveland .....Jan. 11
American Society of Mechanical Engineers, Annual Meeting, New York City .....Dec. 5-8
Automotive Equipment Association, Coliseum, Chicago .....Nov. 7-12
Berlin, Conference on Engineering Materials .....Oct. 22-Nov. 13
National Association of Finance Companies, Congress Hotel, Chicago, Nov. 14-15
National Foreign Trade Council, Houston, Texas .....April 25-27
National Research Council, Washington, D. C. .....Dec. 1-2
National Standard Parts Association, Hotel Hollenden, Cleveland..Nov. 14-18
National Tire Dealers' Association, Brown Hotel, Louisville, Ky..Nov. 15-17
Overseas Automotive Club., Inc., Overseas Visitors' Dinner, Stevens Hotel, Chicago .....Nov. 9
Overseas Automotive Club., Inc., Monthly Luncheon, Hotel Astor, New York .....Dec. 8
United States Good Roads Association and Bankhead National Highway Association, Des Moines..May 28-June 1
World Motor Transport Congress, London .....Nov. 14-17

N. A. D. A.

Chicago, Jan. 31-Feb. 2—Annual, Palmer House.
Chicago, Feb. 1—Banquet, Palmer House, New York, Jan. 9-10—Eastern District, Hotel Commodore.

S. A. E.

National

Chicago, Dec. 1—Tractor Meeting.
Detroit, Jan. 24-27—Annual Meeting.
European trip—Nov. 2-Dec. 12.
New York, Jan. 12—Annual Dinner.

Sectional

Chicago, Nov. 8—Aviation Meeting. The log of the Stanolind, also several reels of motion pictures—J. P. Porter.
Cleveland, Nov. 14—Lacquer Surfaces—Construction, Adaptability and Use—Dr. C. D. Holley.
Detroit, Nov. 7—Inspection trip through Ford Airport. High Flying—W. B. Stout. Latest Phases of Military Aviation—Major Lanphier of Selfridge Field.
Detroit, Nov. 21—Inspection trip through U. S. Rubber Co. Production Progress and Tire Simplification—B. J. Lemon.
Indiana, Nov. 10—Production—C. E. Wilson. Inspection trips through plants of Delco-Remy Corp.
New England, Nov. 9—Precision Measurements in Production and Service—Warren Ames.
Pennsylvania, Nov. 15—Recent Developments in Connection with Engine Lubrication—R. E. Wilson.